



# ***WaveStar*<sup>®</sup> OLS 1.6T (400G/800G)**

## **User/Service Manual (U/SM)**

Release 6.2

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# About this information product

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**Purpose** The WaveStar® OLS 1.6T (400G/800G) User/Service Manual provides detailed descriptions of the operation, maintenance, and task oriented practices that are necessary for optimal performance of the WaveStar® OLS 1.6T system.

The WaveStar® OLS 1.6T is maintained through Task Oriented Procedures (TOPs). A general knowledge and understanding of the software for the OLS 1.6T should precede the use of these TOPs.

**Reason for reissue** This document was reissued to provide new information about Release 6.2 of the WaveStar® OLS 1.6T.

**Safety labels** The following safety labels are used in this document:



### **DANGER**

*This admonishment shows the presence of a hazard that **will** cause death or severe personal injury if the hazard is not avoided.*



### **WARNING**

*This admonishment shows the presence of a hazard that **can** cause death or severe personal injury if the hazard is not avoided.*



### **CAUTION**

*This admonishment shows the presence of a hazard that **will** or **can** cause minor personal injury or property damage if the hazard is not avoided. Caution is also used for property-damage-only accidents. This includes equipment damage, loss of software, or service interruption.*

**Intended audience** This manual is intended primarily for technicians responsible for performing maintenance and trouble clearing tasks for the WaveStar® OLS 1.6T.

**How to use this information product** The sections of the User/Service Manual are indicated with tabs and provide the following information:

[Chapter 1, “Security Administration”](#) provides a detailed description of how the WaveStar® OLS 1.6T manages user accounts and monitors system security.

[Chapter 2, “Operation Interfaces”](#) provides information on system interfaces and associated LEDs.

[Chapter 3, “WaveStar® OLS 1.6T CIT”](#) summarizes information on the hardware and software requirements for Lucent Technologies’



WaveStar® OLS 1.6T Craft Interface Terminal (CIT) application software.

[Chapter 4, “Provisioning”](#) provides information on the process of assigning values to parameters in memory that determine the operating characteristics of the WaveStar® OLS 1.6T.

[Chapter 5, “Performance Monitoring”](#) provides information on proactive maintenance of the WaveStar® OLS 1.6T.

[Chapter 6, “Maintenance”](#) introduces the maintenance features of the WaveStar® OLS 1.6T system and describes the features that continuously monitor the overall health of all the equipment and signals passing through the system.

[Chapter 7, “Alarms and Indicators”](#) discusses alarm mappings and Alarm Severity Assignment Profiles.

[Chapter 8, “Automatic Power Shutdown \(APSD\)”](#) provides information on APSD availability, trigger conditions and system restarts.

[Chapter 9, “Using the Index Lists and Procedures”](#) provides information for using the Index Lists (IXLs), Non-Trouble Procedures (NTPs), Task Oriented Procedures (TAPs), and Detail Level Procedures (DLPs) to perform acceptance, circuit order, operation, and trouble clearing tasks necessary for the WaveStar® OLS 1.6T.

[Chapter 10, “Acceptance Tasks”](#) contains a list of procedures used to accept hardware after installation.

[Chapter 11, “Circuit Order Tasks”](#) contains a list of procedures that are used when adding or deleting work order items for an optical line.

[Chapter 12, “Operations Tasks”](#) contains a list of procedures to use in daily operations.

[Chapter 13, “Trouble Clearing Tasks”](#) covers procedures on clearing the conditions that cause an alarm and procedures for clearing trouble reports, as well as a list of all TAPs and the correct order in which to perform the tasks.

[Chapter 14, “Detail Level Procedures”](#) contains detailed “how-to” instructions, as well as a list of all DLPs and the correct order in which to perform the tasks.

[Appendix A, “Alarm Reference Guide”](#) provides an index and description of the system conditions and alarms.

[Appendix B, “Character Set Definitions”](#) provides the set of symbolic characters for use in User Login ID and Password applications.

The [“Glossary”](#) provides a list of common terms and acronyms.

The Index provides page numbers for key words and subject names.

#### Conventions used

The following conventions are used throughout this guide:

- For each TL1 command (for example, RTRV-LOG/TL1), there are corresponding CIT and SNMS commands.
- ***Italics*** are used for emphasis.
- **Bold** is used for to identify button selections and CIT selections.
- Constant-Width is used to identify conditions and system messages.

#### Related documentation

The *WaveStar® OLS 1.6T User/Service Manual* is part of a set of documents that support the WaveStar® OLS 1.6T system. Ordering information is provided on the copyright page. The following documents are included in the set

| Select Code       | Document Title                                                                              |
|-------------------|---------------------------------------------------------------------------------------------|
| 365-575-713R6.2   | <i>WaveStar OLS 1.6T (400G/800G) Applications Planning Guide (APG)</i>                      |
| 365-575-714R6.2   | <i>WaveStar OLS 1.6T (400G/800G) Applications Ordering Guide (AOG)</i>                      |
| 365-575-716R6.2   | <i>WaveStar OLS 1.6T (400G/800G) Operations Systems Engineering Guide (OSEG)</i>            |
| 365-575-717R6.2   | <i>WaveStar® OLS 1.6T (400G/800G) Installation Manual</i>                                   |
| 365-575-718R6.2   | <i>WaveStar® OLS 1.6T (OLS 400G/800G) System Turn-up Services</i>                           |
| 365-575-793       | <i>WaveStar® OLS 1.6T (400G/800G) Long Single Span Application and Raman Shelf Offering</i> |
| Comcode 109249029 | <i>WaveStar® OLS 1.6T (400G/800G) Software Release Description</i>                          |

**Related training**

The Customer Training and Information Products (CTIP) Organization provides management courses for system planning, engineering, and ordering, as well as courses to train telecommunications technicians in installation, operations, and maintenance. Suitcasing of these courses is also available. Contact the CTIP Organization at **1-888-LUCENT8 (1-888-582-3688)** to enroll in training classes. To arrange suitcase sessions, call the Product Training Manager at **1-800-432-6317** (within USA) or **1-614-764-5542** (worldwide).

The available WaveStar OLS 1.6T courses are listed in the table below.

| Course Number | Course                                                                                                              |
|---------------|---------------------------------------------------------------------------------------------------------------------|
| LW2255        | WaveStar® OLS 1.6T Applications Planning—instructor-led                                                             |
| LW2446        | WaveStar® OLS 1.6T Installation and WaveStar® OLS 1.6T Testing—instructor-led, hands-on (for Lucent Personnel only) |
| LW2655        | WaveStar® OLS 1.6T Operations and Maintenance—instructor-led, hands-on                                              |

**Schedule and Registration**

For more information or to register for any of these courses, call:  
1-888-LUCENT8 and select option 2

Fax: 1-407-767-2677

Or write to:

Lucent Technologies

Customer Training and Information Products

240 E. Central Parkway

Altamonte Springs, FL 32701

**Lightwave Safety  
Guidelines**

The following precautions should be observed.

## General Laser Information



### **DANGER**

*Disabling the APSD feature during installation, servicing, or maintenance results in an FDA/IEC Class IIIB/3B laser hazard.*

The WaveStar® OLS 1.6T and associated optical test sets use semiconductor laser transmitters that emit light at wavelengths between approximately 800 nanometers (nm) and 1600 nm. The emitted light is above the red end of the visible spectrum, which is normally not visible to the human eye. Although radiant energy at near-infrared wavelengths is officially designated invisible, some people can see the shorter wavelength energy even at power levels several orders of magnitude below any that have been shown to cause injury to the eye.

Conventional lasers can produce an intense beam of monochromatic light. Monochromatic light is a single wavelength output of pure color that may be visible or invisible to the eye. A conventional laser produces a small-size beam of light, and because the beam size is small the power density (also called irradiance) is very high. Consequently, lasers and laser products are subject to federal and applicable state regulations as well as international standards for their safe operation.

A conventional laser beam expands very little over distance or is said to be very well collimated. Thus, conventional laser irradiance remains relatively constant over distance. However, lasers used in lightwave systems have a large beam divergence, typically 10 to 20 degrees. Here, irradiance obeys the inverse square law (doubling the distance reduces the irradiance by a factor of 4) and rapidly decreases over distance.

### **Laser Safety and Lucent Products**

Lucent is committed to design optical fiber transmission equipment that minimizes operator and service personnel exposure to potentially hazardous levels of optical energy during service and operation. However, the continued safe use of optical transmission, optical cables and passive optical connection equipment requires a partnership with customers to assure that these systems are deployed and maintained in

a safe manner. While automatic laser power reduction systems in Lucent's higher power transmission equipment respond quickly to reduce laser emissions to safe levels in the event of a fiber disconnection or break, network operators must take proper action in the event of an alarm.

In a typical network, our optical cables and passive optical connection equipment can carry signals from various vendor sources that may have different degrees of safety controls. We urge our customers to properly assess the power of these sources to ensure that their safety controls are adequate.

To strengthen our partnership and to assure the continued safe deployment and use of optical networks, we urge you to use the following standards as your guides for laser safety for your customers and employees:

1. In the U.S.:  
*ANSI Z136.1 - American National Standard for Safe Use of Lasers*, and  
*ANSI Z136.2 - American National Standard for Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources*.
2. Elsewhere:  
*IEC 60825 Safety of Laser Products Part 1: Equipment classification, requirements and user's guide*  
*IEC 60825 Safety of Laser Products Part 2: Safety of optical fiber communication systems*

**Important!** It should be noted that recent studies in Europe have suggested that power as low as 50 mW can ignite certain hazardous (classified) gaseous/vapor/mist/dust environments under worst case, dusty conditions. Standards are being written, both in the US and the International Electrotechnical Commission (IEC), to address optical installations in hazardous (classified) environments. If you must deploy high power systems in such environments, you should assess the impact.

### **Lasers and Eye Damage**

Light energy emitted by laser and high-radiance light-emitting diodes (LEDs) in the 400- to 1400-nm range may cause eye damage if absorbed by the retina. When a beam of light enters the eye, the eye magnifies and focuses the energy, magnifying the irradiance. The irradiance of the energy that reaches the retina is approximately  $10^5$  or

100,000 times that at the cornea, and if sufficiently intense, may cause a retinal burn.

The damage mechanism at the wavelengths used in telecommunications is thermal in origin, that is, damage caused by heating. Therefore, a specific amount of energy is required for a definite time to heat an area of retinal tissue. Damage is not instantaneous. It occurs only when one looks at the light sufficiently long enough that the product of the retinal irradiance and the viewing time exceeds the damage threshold. Light energies above 1400 nm would cause surface and skin burns and do not affect the retina. The thresholds for injury at wavelengths greater than 1400 nm are significantly higher than for wavelengths in the retinal hazard region.

### **Classification of Lasers**

Manufacturers of lasers and laser products in the United States are regulated by the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) under 21 CFR 1040. These regulations require manufacturers to certify each laser or laser product as belonging to one of six major Classes I, II, IIa, IIIa, IIIb, or IV. The International Electro-technical Commission is an international standards body that writes laser safety standards under IEC-60825. Classification schemes are similar with Classes divided into Classes 1, 2, 3A, 3B, and 4. Lasers are classified according to the accessible emission limits and their potential for causing injury. Lightwave systems are generally classified as Class I/1, because, under normal operating conditions, all energized laser transmitting circuit packs are terminated on optical fibers which enclose the laser energy with the fiber sheath forming a protective housing. Also, covers are in place over the circuit pack shelves. The circuit packs themselves, however, may be FDA/CDRH Class I or IIIb, or IEC Class 1, 3A, or 3B.

### **Lightwave Safety Precautions**

Under normal operating conditions, the WaveStar® OLS 1.6T system is totally enclosed and presents no risk of eye injury. It is a Class I system under the FDA/CDRH scheme.

The lightguide cables that interconnect various components of a lightwave system can disconnect or break and may expose people to lightwave emission. Also, certain measures and maintenance procedures may expose the technician to emission from the semiconductor laser during installation and servicing. Unlike more familiar laser devices, such as solid-state and gas lasers, the emission

pattern of a semiconductor laser results in a highly divergent beam. In a divergent beam, the irradiance (power density) decreases rapidly with distance. The greater the distance, the less energy will enter the eye and the less potential risk for eye injury.

Inadvertently viewing an unterminated fiber or damaged fiber with the unaided eye at distances greater than 5–6 in normally will not cause eye injury provided the power in the fiber is less than a few milliWatts at the shorter wavelengths and higher at the longer wavelengths. However, damage may occur if an optical instrument such as a microscope, magnifying glass, or eye loupe is used to stare at the energized fiber end.



## **WARNING**

*Use of controls, or adjustments, or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.*

### **Safety Precautions for Enclosed Systems**

Under normal operating conditions, the WaveStar® OLS 1.6T System is completely enclosed; nonetheless, the following precautions should be observed:

- Because of the potential for eye damage, technicians should neither disconnect any lightwave cable nor splice or stare into the optical connectors terminating the cables.
- Under no circumstance should lightwave/lightguide operations be performed by a technician before satisfactorily completing an approved training course.
- Since viewing lightwave emission directly with an optical instrument such as an eye loupe greatly increases the risk of eye damage, an appropriate label must appear in plain view on the front of the main frame or lightguide termination/interconnection equipment.

### **Safety Precautions for Unenclosed Systems**

During service, maintenance, or restoration, the WaveStar® OLS 1.6T system is considered unenclosed. During service, maintenance, or restoration, observe the following precautions:

- Only authorized, trained personnel should be permitted to do service, maintenance, and restoration. Avoid exposing the eye to emissions from unterminated, energized optical connectors at close distances. Laser modules associated with the optical ports of laser circuit packs are typically recessed, which limits the exposure distance. Optical port shutters and Automatic Power Reduction (APR) are engineering controls that are also used to limit the emissions. However, technicians removing or replacing regenerators should not stare or look directly into the vacant regenerator slot with optical instruments or magnifying lenses. (Normal eyewear or indirect viewing instruments, such as Find-R-Scope's infrared optical viewers, are not considered magnifying lenses or optical instruments.)
- Only authorized, trained personnel should use the lightwave test equipment during installation or servicing, since this equipment contains semiconductor lasers. [Some examples of lightguide test equipment are Optical Time Domain Reflectometers (OTDRs), Hand-Held Loss Test Sets, and Feature Finders.]
- Under no circumstances should any personnel scan a fiber with an optical test set without verifying that all lightwave sources on the fiber are turned off.
- All unauthorized personnel should be excluded from the immediate area of lightwave transmission systems during installation and service.

Consult *ANSI Z136.1, American National Standard for Safe Use of Lasers* in the U.S., or outside the U.S., *IEC-60825, Part 2*, for guidance on the safe use of optical fiber optic communication systems in the workplace.

### **Warning and Compliance Labels**



**Warning Label**

A warning label is provided on the inside front cover of each shelf assembly. The warning label shows the word "DANGER" in white lettering on a safety red background, and the text of the warning label in black lettering on a white background. See the figure below.



The label states (in both English and French):

***DANGER***

***INVISIBLE LASER RADIATION WHEN OPEN  
AND FIBER DISCONNECTED***

***Avoid direct exposure to beam.***

***Do not view beam with optical instruments.***

**IEC Caution Label**

An IEC "CAUTION" label is provided on the inside front cover of each shelf assembly. See the figure below.



This label uses black lettering on a safety yellow background, and states in both English and French:

***CAUTION***

***INVISIBLE LASER RADIATION WHEN OPEN AND FIBER DISCONNECTED***

***Do not stare into beam or view directly with optical instruments.***

**IEC Hazard Level Label**

An IEC "HAZARD LEVEL" label is provided on the faceplate of all circuit packs with optical connectors which could permit access to

IEC 1M emissions. This includes the OA, ODU1, and WAD Circuit Packs. See the figure below.



#### **Rear Cover Warning Label**

An warning label is provided on the rear cover of each equipment bay, cabinet, and miscellaneous mounted shelf that states:

***NOTICE: UNTERMINATED OPTICAL CONNECTORS MAY  
EMIT LASER RADIATION. AVOID DIRECT EXPOSURE TO  
THE BEAM. DO NOT VIEW BEAM WITH OPTICAL  
INSTRUMENTS.***

#### **System Compliance Label**

A compliance label stating that the system has been certified, along with the manufacturer's name and place of manufacture, is attached to the rear of each equipment bay, cabinet, and miscellaneous mounted shelf. The figure below shows an example of a compliance label. The

compliance label is located on the rear of the equipment cabinet (at eye level) and miscellaneous mounted shelves.



**Lucent**

**WAVESTAR OLS 400G LIGHTWAVE TERMINAL BAY**  
**J69002A, L1, L2, L3, L6, L7 OR L8 BAY**

**Lucent Technologies Inc.**  
**1600 Osgood Street**  
**North Andover, MA, U.S.A.**

**Date Of Manufacture and Bay List No. L ( ) May Be Viewed Behind The Bumper Label Bracket Designation At The Top Of The Bay (On The Front Of The L1, L2, Or L3 Bay, On The Rear Of The L6, L7 Or L8 Bay).**  
**La date de fabrication et le numéro de liste L ( ) de la baie sont visibles derrière la désignation du support de l'étiquette du butoir dans la partie supérieure de la baie (sur le devant de la baie L1, L2 ou L3, ou derrière la baie L6, L7 ou L8).**

**POWER REQUIREMENTS: Up To Forty Six (46) -48V == Input Power Feeders Per System (2 Per L1, L2, L6 Or L7 Bay, Or 4 Per L3 Or L8 Bay), Each Rated 45 Amps ==.**  
**EXIGENCES D'ALIMENTATION: Au plus quatre six (46) artères d'entrée 48 V c.c. par système (2 par L1, L2, L6 ou L7 section, ou 4 par L3 ou L8 section), d'une puissance de 45 A c.c. chacune.**

**To Be Power Only By Safety Extra Low Voltage (SELV) -48 == Source.**

**Complies With 21 CFR 1040.10 And 1040.11.**  
**Conforme aux documents 21 CFR 1040.10 et 1040.11.**



**LISTED 538E**  
**Telephone**  
**Equipment**





**LR 93283**

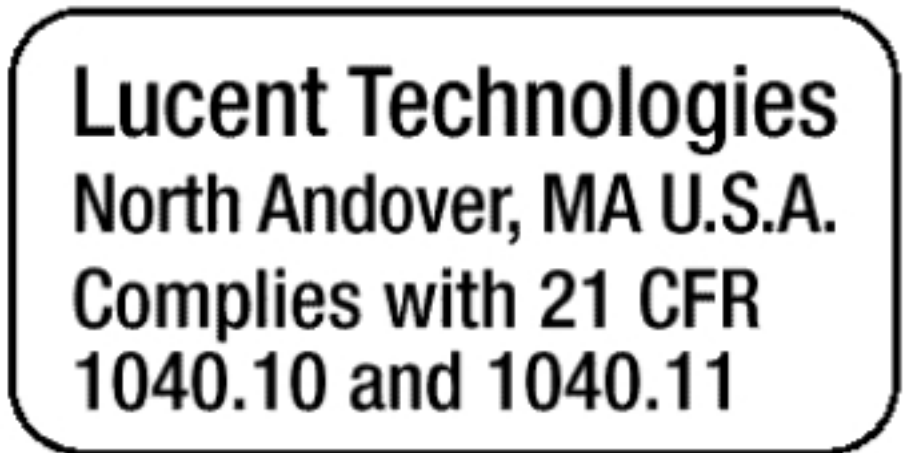
**This Digital Apparatus Does Not Exceed The Class A Limits For Radio Noise Emissions Set Out In The Radio Interference Regulations Of The Canadian Department of Communications**  
**Cet appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A spécifiées dans le règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada**

**This Device Complies With Part 15 Of The FCC Rules. Operation Is Subject To The Following Two Conditions: (1) This Device May Not Cause Harmful Interference And (2) This Device Must Accept Any Interference Received, Including Interference That May Cause Undesired Operation.**

### Laser Diode Compliance Label

A Laser Diode Compliance Label is attached to the non-component side of the PWB of each circuit pack containing a laser diode. This

includes all OA, OTU, and SUPVY circuit packs. See the figure below.



## Electrostatic Discharge (ESD)

### Introduction

The following information must be considered whenever working on the WaveStar® OLS 1.6T system, or one of its components.



### CAUTION

*Industry experience has shown that all circuit packs containing circuits can be damaged by static electricity that builds up on work surfaces and personnel. The static charges are produced by various charging effects of movement and contact with other objects. Dry air allows greater static charges to accumulate. Higher potentials are measured in areas with low relative humidity, but potentials high enough to cause damage can occur anywhere.*

## Precautions

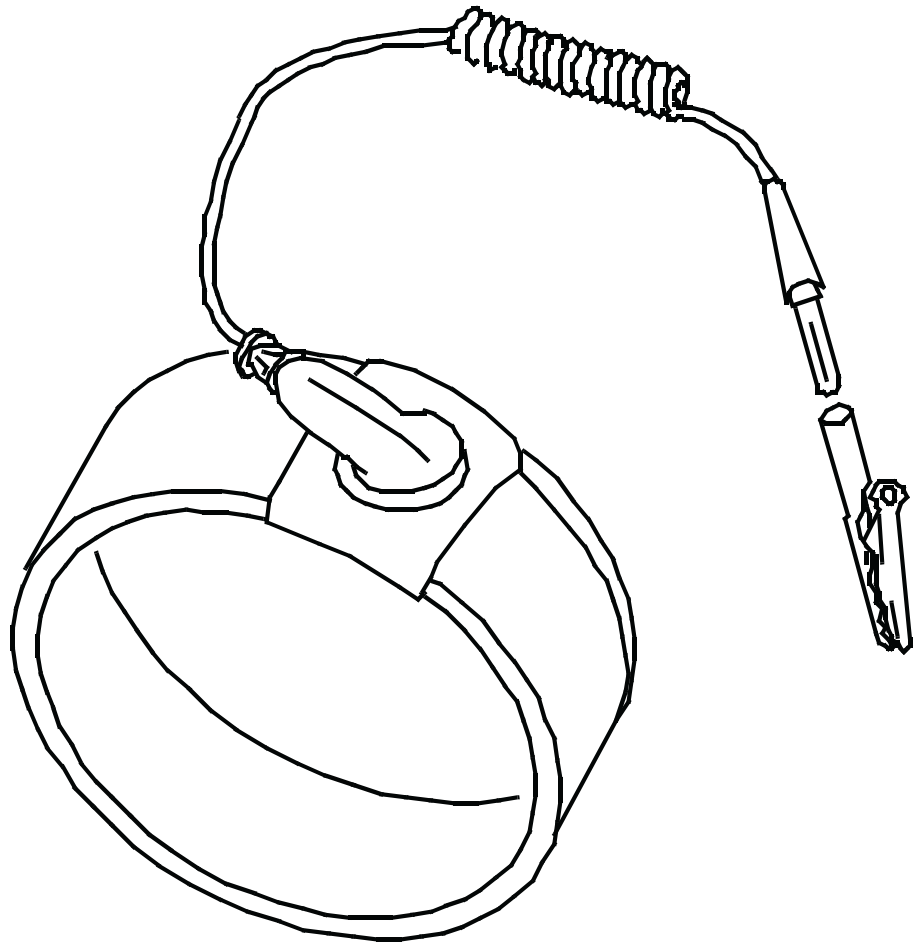
The following precautions must be observed when handling circuit packs/units to prevent damage by electrostatic discharge:

- Assume all circuit packs contain solid-state electronic components that can be damaged by electrostatic discharge (ESD).
- When handling circuit packs/units (storing, installing, or removing) or when working on the backplane, always wear a grounded wrist strap or wear a heel strap and stand on a grounded, static-dissipating floor mat.
- Handle all circuit packs/units by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.
- Observe all warning labels on bags and cartons. Whenever possible, do not remove circuit packs/units from antistatic packaging until ready to insert them into slots.
- If possible, open all circuit packs/units at a static-safe work position, using properly grounded wrist straps and static-dissipating table mats.
- Always store and transport circuit packs/units in static-safe packaging. Shielding is not required unless specified.
- Keep all static-generating materials such as food wrappers, plastics, and Styrofoam containers away from all circuit packs/units. When removing circuit packs/units from a cabinet, immediately place the circuit packs/units in static-safe packages.
- Whenever possible, maintain relative humidity above 20 percent.
- Always keep the electromagnetic interference (EMI)/ESD protective front covers on the shelves except during an upgrade or maintenance procedure. Once a circuit pack/unit is replaced in the shelf, immediately close the front cover.

## Grounding Wrist Straps

Any connectors on the shelf interconnection panel that are not cabled should be fitted with a plastic dust cap to provide ESD protection. To reduce the possibility of ESD damage, shelves are equipped with grounding jacks to enable personnel to ground themselves using wrist straps while handling circuit packs/units or working on a shelf. See

the figure below. The wrist straps should be checked periodically with a wrist strap tester to ensure that they are working properly.



The grounding jacks for connection of wrist straps are located under the power switches on each shelf, fuse/power indicating panel, user panel, the right-front of the equipment cabinet, and the rear of the equipment bay. These jacks are labeled.

## Safety Instructions

### Save These Instructions

***READ AND UNDERSTAND ALL INSTRUCTIONS***

When using this telecommunication equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

- Follow all warnings and instructions marked on the product.
- Slots and openings in this product at the back or bottom are provided for ventilation. To protect it from overheating, these openings must not be blocked or covered.
- Opening or removing rear covers or sheet-metal parts may present exposure to high current or electrical energy levels, or to other risks.
- Never push objects of any kind into this product through slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock. Never spill liquid of any kind on the product.
- Refer servicing to qualified service personnel.
- Use caution when installing and modifying telecommunications lines.
- Never install telecommunication wiring during a lightning storm.
- Never install telecommunication jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telecommunication wires or terminals unless the telecommunication line has been disconnected at the network interface.
- Installation must include an independent frame ground conductor to building ground. Grounding/bonding circuit continuity is vital for safe operation of this equipment. Never operate with grounding/bonding conductor disconnected.
- This product has two -48 Vdc input power feeders. Disconnecting one power feeder will not de-energize the product. To reduce the risk of injury, disconnect both power supply cables when removing power from the system.
- Metallic telecommunication interfaces should not leave the building premises unless connected to telecommunication devices providing primary and secondary protection, as applicable.
- For continued protection against risk of fire, replace only with same type and rating of fuse.



- Use only Lucent Technologies manufactured, recognized circuit packs/units/modules. Refer to the *WaveStar® OLS 1.6T Installation Manual*, (365-575-717R6.2).
- This equipment is intended for installation in Restricted Access Locations where access is controlled or where access can only be gained by service personnel with a key or tool. Access to this equipment is restricted to qualified service personnel only.
- Power the unit only from -48 Vdc sources providing Safety Extra Low Voltage (SELV) outputs.
- This equipment must be provided with a readily accessible input power disconnect device as part of the building installation (such as a main power disconnect switch or external circuit breaker).

***SAVE THESE INSTRUCTIONS.***

**Technical Support**

Assistance in maintaining an installed system is available through Customer Technical Assistance Management (CTAM). CTAM routes the calls to either the Regional Technical Assistance Center (RTAC) or Customer Technical Support (CTS). Technical support personnel troubleshoot field problems twenty-four hours a day over the telephone and, if necessary, on site. In addition to the help at CTAM, Lucent Technologies also maintains a Customer Support website, [www.lucnet.support.com](http://www.lucnet.support.com). The website provides customers with a way to access data in three different applications: Assistance Request, Solutions, and Product Notifications. Assistance Request allows external customers to search their Assistance Requests and to submit new Assistance Requests. Solutions allows customers to view and search known problems and solutions for products. Product Notifications allows customers to view and search for the latest information regarding Lucent products. For inquiries on obtaining a login, contact CTAM at the appropriate number below.

If you require additional assistance from Lucent Technologies, or need technical assistance, call:

|               |                |
|---------------|----------------|
| Domestic      | 1-800-225-4672 |
| International | 1-630-224-3672 |

When calling CTAM, make sure to have the following information on-hand:

- product name
- product version
- RTAC or CTS contact name (if there is a specific contact)
- your phone number
- site number (if there is more than one site)
- site location (city and state)
- priority: 1-Outage, 2-High, 3-Medium, and 4-Low
- a brief description of the problem

RTAC organizations are supported by a centralized CTS for transmission products. CTS maintains a close relationship with Bell Laboratories and other Lucent organizations to expedite resolutions and maintain contact with the development community. This association provides continuous accessibility to every phase in a product life cycle and assures a prompt resolution to all inquiries.

## **Ordering Documents**

The WaveStar® OLS 1.6T customer documents for Release 6.2 can be ordered as individual paper copies or as a set on a CD-ROM from the Lucent Technologies. Lucent entities should access at <http://www.lucentdocs.com> or <http://www.lucent8.com>, while all other customers may access at <http://www.lucentdocs.com>.

### **Additional Copies/Standing Order List**

To order additional copies of this document and/or request placement on the standing order list, send or call in the request as follows:

| <b>Customer</b>                     | <b>Mail Order</b>                                                                                                       | <b>Telephone Order<br/>(Monday through Friday)</b>                                                                                                                                                                                                                                                                                             |
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| RBOC/BOC                            | Process through your Company<br>Documentation Coordinator                                                               |                                                                                                                                                                                                                                                                                                                                                |

**Notes:**

1. For commercial customers, a check, money order, purchase order number, or charge card number is required with all orders. Make checks payable to Lucent Technologies.
2. Lucent entities should use Form IND 1-80.80 FA.

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We welcome your comments. A feedback form is located immediately after the title page of this manual. Please fill out the form and fax it to +1 732-949-5000, or to the number shown on the form. If the feedback form is missing, please fax your comments to +1 732-949-5000. You can also send comments about this document to:  
  
Lucent Technologies

Room 3E-609  
101 Crawfords Corner Road  
Holmdel, NJ 07733



# 1 Security Administration

## Overview

---

**Purpose** Release 6.2 of the WaveStar® OLS 1.6T introduces improved functionality and dozens of enhancements to the WaveStar® OLS 1.6T CIT.

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## Standard Security Features

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**Identity** User identity is specified using a User ID — a unique identifier used by a Network Element (NE) to perform security management functions.

**Authentication** A password is used to verify the identity of the user. The password feature includes several levels of access privileges. The password feature also includes password aging, which forces the users to change their password periodically. If the password is not changed within a provisioned period of time, the password expires.

**Access Control** Specific users are allowed commands to specific objects. This feature is also used to activate or disable non-Super User logins quickly, for example, during routine maintenance or upgrade activities.

Other access control features include:

- User ID Lockout
- Inactivity Timers
- Intrusion Alert Alarms
- User Login Aging
- Temporary Logins

**Security Administration** The NE provides security administration mechanisms that allow an administrator to control the usage and management of user logins, security features, and database of the NE, and to generate security audit trails when necessary via the corresponding network management interfaces.

**Audit Trail** All security related transactions are recorded in the NE History Log. If a security breach is suspected, an audit trail can be performed to investigate whether/how the breach occurred.

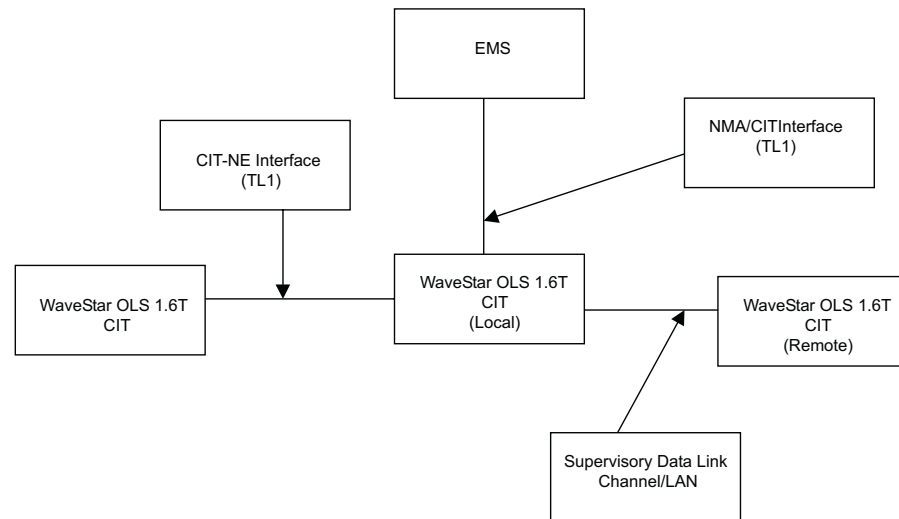


## NE Security Interfaces

## Network Interfaces

Two separate network interfaces support security management within the WaveStar® OLS 1.6T. The EMS-NE Interface supports both TL1 via the OS port over OSI, and TL1 over TCP/IP. CIT-NE via the CIT port supports only TL1 over TCP/IP. See Figure 1-1 for a view of the interfaces supported by NEs.

### Figure 1-1 Interfaces Supported by NEs



The two Super User logins are supported via the EMS interface for login session association. The NE allows the EMS to change the Super User ID and Password in the NE's local database.

The NE allows security administration functions to be performed via the CIT interface. A supervisory data link channel between the NEs can be used as a data communication channel(s) for remote access from the local NE to another remote NE using the CIT.

## 10BaseT Ports

There are two 10BaseT ports available on the NE to support management functions of the NE, the CIT port and the OS port. The NE does not allow disabling of the 10BaseT ports.



## NE Logins

---

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>              | The NE provides a user with the appropriate security administration privileges to allow the user to add, modify, and delete non-Super User logins via the CIT Interface.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Super User Logins</b>     | The NE supports two Super User logins via the TL1 interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Non-Super User Logins</b> | The NE supports the management of 510 non-Super User logins via the CIT or the NMA TL1 interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Simultaneous Logins</b>   | The NE allows only Super Users from both the CIT and OS to log onto the NE using the same logins simultaneously.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Modifications</b>         | The NE does not allow any user to modify their own login security parameters, with the exception of changing their own password.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Temporary Logins</b>      | <p>The NE allows a user with Security Administration privileges to create temporary logins with provisionable expiration dates (Temporary Login Aging). These temporary logins are automatically deleted on the specified date regardless of the frequency of use of the login.</p> <p>The User Login can be changed from "regular" into "temporary." There is no way to change from a temporary to a regular. If the administrator wants to change the temporary login ID to a regular login, he/she must delete the temporary login, and then use the same login id to create a regular user.</p> |
| <b>User Login Aging</b>      | The NE allows a user with Security Administration privileges to globally set the Login Aging parameter. This parameter may be provisioned to be 0 to 999 days, where the original value is 120 days. A value of 0 disables login aging. As long as a non-Super User logs in more frequently than the value of this parameter, the login remains active. If a user does not login to the NE within the specified period, the login is deleted.                                                                                                                                                       |

**Important!** Login aging applies only to non-Super User logins.

- User ID Definition** The User ID consists of a string of case-sensitive alphabetic and/or numeric characters containing a minimum of one character and a maximum of ten characters from the defined character sets. Refer to [Appendix B, “Character Set Definitions”](#) for complete character set definitions.
- Disabling a User ID** The NE allows a user with the appropriate administrative privileges to disable an existing non-Super User ID on demand. Disabling a login prevents the User ID from establishing a session. If the User ID is currently active, the User Login Session is automatically terminated.
- Re-enabling a User ID** The NE allows a user with the appropriate administrated privileges to re-enable an existing non-Super User ID.
- Port Security** All ports require a Login ID and password in order to gain access.



## NE Original Logins

---

**Super User Logins** The NE supports two Super User logins/passwords, shown in Table 1-1 below.

**Table 1-1 Original Login ID**

| Login                    | Password  |
|--------------------------|-----------|
| LUC01 (LUCent-zero-one)  | WS400G+01 |
| LUC02 ( LUCent-zero-two) | WS400G+02 |

These two original Super User logins are supported via the TL interface.

**Creating New Super User Logins** The creation of additional Super User logins is not permitted by the NE.

**Changing Super User Logins** A Super User ID and Password can be changed with the following restrictions:

- A Super User ID can only be changed by the other Super User.
- The Super User access privilege can not be modified.
- Only a Super User is able to change the other Super User password.

**Deleting Super User Logins** Deletion of either Super User login is not permitted by the NE.



# NE Passwords

---

- Overview** Passwords are encrypted and stored in the NEs's database using strong encryption industry standards. Passwords will never be transmitted from the NE to the CIT or NMA.
- Password Definition** Passwords consists of a string of a minimum of six and up to a maximum of ten alphabetic, numeric, and symbolic characters.
- Passwords consist of at least one alphabetic character, one numeric character, and one symbolic character. Refer to [Appendix B, "Character Set Definitions"](#), for a complete list of character set definitions.
- Passwords containing non-legal characters will be denied.
- Administration** The NE provides each user the ability to change their own password based on password aging requirements. Passwords may be changed via the CIT or OS port interfaces.
- The NE tracks the date of the last password change. If more days have passed than the provisioned allowable number of days, the NE considers the password as expired.
- Non-Super User passwords are considered expired the first time a user logs in successfully following login creation. This forces users to change the original passwords that are provided by the security administrator.
- Password Aging** A user is prevented from changing a password for the seven days immediately following a password change.
- Once a password has expired, the user is required to change the password. Only after the user successfully changes the password will the NE allow the user access to the NE.



## NE User Login Security

---

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Access Control</b>        | <p>User login security controls access to NEs by individual users. The NE authenticates the user IDs and passwords against the NE's local security database.</p> <p>Once the user logs into a NE with a valid User ID and Password, user functions can then be performed based on the assigned User Access Privilege.</p> <p>User login access will be denied via the OS-OSI interface during any NE reset processes, but is allowed once the NE reset in progress condition is cleared.</p>                                           |
| <b>Functional Categories</b> | <p>All commands supported by NEs are grouped into the following five functional categories (assigned symbol shown in parentheses):</p> <ul style="list-style-type: none"><li>• Security Administration (S)</li><li>• Provisioning (P)</li><li>• Performance Monitoring (PM)</li><li>• Maintenance (M)</li><li>• Test Access (T)</li></ul>                                                                                                                                                                                              |
| <b>Authorization Levels</b>  | <p>Authorization Levels are used to add a measure of fine granularity to access control by restricting a user's access to certain commands within each functional category.</p> <p>The WaveStar® OLS 1.6T System supports six authorization levels. These levels are listed below in descending level of privilege:</p> <ul style="list-style-type: none"><li>• Level 5 — Full authorization access</li><li>• Level 4</li><li>• Level 3</li><li>• Level 2</li><li>• Level 1</li><li>• Level 0 — No authorization is assigned</li></ul> |
| <b>User Privilege Code</b>   | <p>The User Privilege Code (UPC) is a combination of the Functional Category (FC) plus the Authorization Level (AL). Each NE supports the use of a UPC determining the set of commands that any given user is authorized to execute.</p>                                                                                                                                                                                                                                                                                               |

**User Access Privilege  
(UAP) Assignments**

The User Access Privilege (UAP) is a combination of UPCs that are assigned to a user based on the user's work/functional responsibility.

Each User Login is assigned, at a minimum, an S1 UAP.

The NE provides each user with Security Administration privileges the ability to assign the UAP for users added to the NE's local database according to the TL1 commands the user is authorized to execute.

Available UAP assignments are:

- S[1-5] — For Security Administration (SA), Authorization Level 1 through 5.
- T[0-5] — For Test Access (TA), Authorization Level 0 through 5.
- PM[0-5] — For Performance Monitoring (PM), Authorization Level 0 through 5.
- P[0-5] — For Provisioning (P), Authorization Level 0 through 5.
- M[0-5] — For Maintenance (M), Authorization Level 0 through 5.

The authorization levels for all Function Categories are specified for each newly created User ID. Multiple UPCs (FC + AL) are specified using single ampersands (&) in TL1.

Refer to Table 1-2 for the mapping of TL 1 Commands to User Privilege Codes.

**Table 1-2 Mapping of TL1 Commands to User Privilege Codes**

| Auth. Level | Functional Categories                                                              |                 |    |                 |                 |
|-------------|------------------------------------------------------------------------------------|-----------------|----|-----------------|-----------------|
|             | P                                                                                  | M               | PM | T               | S               |
| 5           |                                                                                    |                 |    |                 | ABORT-DB-BACKUP |
|             |                                                                                    |                 |    |                 | DLT-USER-SECU   |
|             |                                                                                    |                 |    |                 | ED-USER-SECU    |
|             |                                                                                    |                 |    |                 | ENT-USER-SECU   |
|             |                                                                                    |                 |    |                 | ENT-NE-SECU     |
|             | Including all commands below for each of the functional categories being assigned. |                 |    |                 |                 |
| 4           |                                                                                    | OPR-PROTNSW-OTP |    | TEST-AUTO-LOCAL | ALW-FMM-RMVL    |
|             |                                                                                    | RLS-PROTNSW-OTP |    |                 | BACKUP-DB       |
|             |                                                                                    |                 |    |                 | CPY-PRGM        |
|             |                                                                                    |                 |    |                 | DWNLD-SW        |
|             |                                                                                    |                 |    |                 | ED-DAT          |
|             |                                                                                    |                 |    |                 | ENT-CID-SECU    |
|             |                                                                                    |                 |    |                 | ENT-SYS         |
|             |                                                                                    |                 |    |                 | INH-FMM-RMVL    |
|             |                                                                                    |                 |    |                 | INIT-SYS        |
|             |                                                                                    |                 |    |                 | INIT-SWD        |
|             |                                                                                    |                 |    |                 | PROV-SYS        |
|             |                                                                                    |                 |    |                 | RESTORE-DB      |
|             |                                                                                    |                 |    |                 | RTRV-USER-SECU  |
|             | Including all commands below for each of the functional categories being assigned. |                 |    |                 |                 |

**Table 1-2 Mapping of TL1 Commands to User Privilege Codes (continued)**

| Auth. Level | Functional Categories |                 |                    |              |               |
|-------------|-----------------------|-----------------|--------------------|--------------|---------------|
|             | P                     | M               | PM                 | T            | S             |
| 3           | DTL-ASSOC-OTPS        | ALW-MSG-EQPT    | INIT-PM-FTAM       |              | CPY-BOOTFLASH |
|             | ENT-ASSOC-OTPS        | DLT-ASAP-PROF   | INIT-REG-ALL       | FACTORY-UTIL | ENT-OSI       |
|             | ENT-OLPP              | ED-ASAP-PROF    | INIT-REG-OTPS      | FACTORY-UTIL | ENT-RMA       |
|             | ENT-OTPS              | ENT-ASAP-PROF   | SET-BASELINE-OCHAN |              | ENT-TSB       |
|             | ENT-SUPR              | ENT-PROF-ASGNMT | SET-BASELINE-OLINE |              |               |
|             | ENT-TMGSRG-SUPR       | ENT-OCHTRC      | SET-BASELINE-SUPR  |              |               |
|             | UPD-SYS               | ENT-SECTRC      | SET-PM-STIME       |              |               |
|             |                       | INH-MSG-EQPT    | SET-TH-OCHAN       |              |               |
|             |                       | OPR-ACO-ALL     | SET-TH-OLINE       |              |               |
|             |                       | OPR-EXT-CONT    | SET-TH-OTPS        |              |               |
|             |                       | OPR-NIS-IND     | SET-TH-SUPR        |              |               |
|             |                       | OPR-TRACE-OTU   |                    |              |               |
|             |                       | OPR-TRACE-SUPVY |                    |              |               |
|             |                       | RLS-EXT-CONT    |                    |              |               |
|             |                       | RLS-NIS-IND     |                    |              |               |
|             |                       | RLS-TRACE-OTU   |                    |              |               |
|             |                       | RLS-TRACE-SUPVY |                    |              |               |
|             |                       | SET-ATTR-ALM    |                    |              |               |
|             |                       | SET-ATTR-CONT   |                    |              |               |
|             |                       | SET-ATTR-ENV    |                    |              |               |
|             |                       | TEST-ALM        |                    |              |               |
|             |                       | TEST-LED        |                    |              |               |
|             |                       |                 |                    |              |               |



**Table 1-2 Mapping of TL1 Commands to User Privilege Codes (continued)**

| Auth. Level | Functional Categories                                                   |                  |                     |          |                |
|-------------|-------------------------------------------------------------------------|------------------|---------------------|----------|----------------|
|             | P                                                                       | M                | PM                  | T        | S              |
| 2           | Currently, there are no commands associated with Authorization Level 2. |                  |                     |          |                |
| 1           | RTRV-ASSOC-OTPS                                                         | RTRV-AID-ASGNMT  | RTRV-BASELINE-OCHAN |          | ACT-USER       |
|             | RTRV-EQPT                                                               | RTRV-ALM-ALL     | RTRV-BASELINE-OLINE |          | CANC-USER      |
|             | RTRV-OLPP                                                               | RTRV-ASAP-PROF   | RTRV-BASELINE-SUPR  |          | ED-PID         |
|             | RTRV-OTPS                                                               | RTRV-ATTR-ALM    | RTRV-PM-OCHAN       |          | RTRV-AO        |
|             | RTRV-SUPR                                                               | RTRV-ATTR-CONT   | RTRV-PM-OLINE       |          | RTRV-CID-SECU  |
|             | RTRV-TMGSRG-SUPR                                                        | RTRV-ATTR-ENV    | RTRV-PM-OTPS        |          | RTRV-DAT       |
|             |                                                                         | RTRV-COND-ALL    | RTRV-PM-STIME       |          | RTRV-HDR       |
|             |                                                                         | RTRV-MAP-NEIGHBO | RTRV-PM-SUPR        |          | RTRV-LOG       |
|             |                                                                         | RTRV-MAP-RING    | RTRV-TH-OCHAN       |          | RTRV-NE-SECU   |
|             |                                                                         | RTRV-NIS-IND     | RTRV-TH-OLINE       |          | RTRV-OSI       |
|             |                                                                         | RTRV-UCHTRC      | RTRV-TH-OTPS        |          | RTRV-RMA       |
|             |                                                                         | RTRV-PROF-ASGNM  | RTRV-TH-SUPR        |          | RTRV-SWDB-ATTR |
|             |                                                                         | RTRV-PROTN-GROU  |                     |          | RTRV-SYS       |
|             |                                                                         | RTRV-SECTRC      |                     |          | RTRV-TSB       |
|             |                                                                         | RTRV-STATE       |                     |          |                |
|             |                                                                         | RTRV-TRACE-OA    |                     |          |                |
|             |                                                                         | RTRV-TRACE-OTU   |                     |          |                |
| 0           | No Auth.                                                                | No Auth.         | No Auth.            | No Auth. | Not Applicable |

- UAP Provisioning Example** A User ID that requires a high provisioning privilege can be provisioned via the WaveStar® OLS 1.6T as **S2&P5&PM1&M0&T3** — where each functional category is assigned the following Authorization Level:
- Security Level 2
  - Provisioning Level 5
  - Performance Monitoring Level 1
  - Maintenance Level 0 (no authorization)
  - Test Level 3
- Minimum UAP Assignment Level** A minimum UAP Level of S1 must be assigned to each user login so that the users can log into the NE.
- Super Users** A Super User is allowed to perform all NE functions, including, but not limited to:
- Functions affecting security
  - Access to the NE
  - System Initialization
  - NE Testing
  - Software Installation
  - Database Management
  - Software Management
- Only Super Users have the original preset UAP values of:
- S5
  - P5
  - PM5
  - M5
  - T5



## NE Login Sessions

---

**Channel State** NE channels can be in one of three possible states:

- Login Active
- Login Inactive
- Password Expired

**Channel ID** A Channel ID is a unique identifier for each channel login session in support of either a 10BaseT port for login or a remote login session.

The NE supports the number of channels that are accessible by the OSs from the following NE interfaces:

- Supervisory Data Link for the remote TL1 login associations; maximum of eight channels (that is, inbound)
- TL1 Interface; maximum of 16 channels
- CIT Port; maximum of five channels

The NE allows the WaveStar® OLS 1.6T CIT to log onto multiple remote NEs with or without having logged into the local NE (point of attachment).

**Login Active State** A channel enters the Login Active State when a valid login command without an expired password is received by the NE. A channel reverts to the Login Inactive State when a valid logoff command is received by the NE, or a condition occurs in the NE or local NE that requires a cancellation of a login session.

**Login Inactive State** All channels are, by default, in the Login Inactive state. A channel transitions out of this state when a valid login command is received by the NE. When a channel is in the Login Inactive state, the NE does not respond to any requests other than valid login requests. In addition, no notification messages appear on a channel in the Login Inactive State.

**Password Expired State** A channel enters the Password Expired state when the NE receives a valid login command, but the Password for the User ID in the command has expired. In this state, the NE partially completes the command with text explaining that the User's Password has expired, and only accepts a Change Password command. If the command is successful, the User Login proceeds normally, and the channel enters the Login Active State. In all other cases, the channel returns to the Login Inactive State.



## NE Login-Access Security Procedures

---

**Description** A login attempt is successful if all of the following conditions are met:

- A provisioned User ID and correct Password are entered
- The User ID Lockout threshold has not been exceeded
- The User Login and NE Login Security are enabled (that is, non-Super Users are permitted to log onto the NE)

However, if these conditions are not met, the NE Login-Access Security feature will deny access to a user when attempting to log in, or may disconnect a user during an active session.

**Login Session Disconnect** If a login session is active on a particular channel when the user successfully logs off from the NE:

1. Any responses to commands originating on the channel currently executing on the NE are dropped.
2. A logout:user-id message is recorded in the local NE's History Log.

If a login session is active on a particular channel and the NE or remote NE must disconnect:

1. Responses to any commands originating on the channel currently executing on the NE are dropped.
2. A logout:user-id-remote link down message is recorded in the local NE's History Log.

If a login session is active on a particular channel when the User is disabled by the Security Administrator:

1. Any commands that originated on the channel currently executing on the NE are dropped.
2. A logout:user-id-forced disconnect message is recorded in the local NE History Log.

**Login Session Denied** A login session is denied for any one of the following reasons:

- Invalid User ID
- Invalid Password
- When login attempts exceed the User ID Lockout Threshold and the User ID Lockout Period is not over

- User ID is disabled
- Non-Super User NE logins are disabled

When a login attempt on a channel is denied:

1. A Login:user-id-DENY message is recorded in the History Log.
2. A Login Failed message is sent on the channel associated with the login attempt with no explanatory messages included.



## NE User ID Lockout

---

**Threshold** Each time the number of invalid sequential login attempts reaches the User ID Lockout Threshold for the same User ID, the NE prevents the User ID from logging in for a number of minutes equal to the **User ID Lockout Period**. After this period expires, the NE resets the User ID Lockout Threshold count to zero.

**Provisionable Parameters** The NE allows a user with the proper security administration privilege to provision the following User ID Lockout parameters on a per NE basis:

- **User ID Lockout Threshold** — the number of sequential invalid login attempts after which the User ID is locked out and an Intruder Alert Alarm is raised. The original value is 5. Range of values is 2 to 99.
- **User ID Lockout Period** — The number of minutes a User ID is locked out. The original value is 10. The provisionable range of values is 0 to 99.

**Important!** Setting the value of the User ID Lockout Period to 0 eliminates the User ID Lockout Period.



## NE Intruder Alert Alarm

---

**Definition** When the total number of login attempts for a specific User ID exceeds the User ID Lockout Threshold on any of the network interfaces, an intrusion alert:user-id event condition is recorded in the NE History Log.

**Important!** The user will automatically be re-enabled once the elapsed time since lockout exceeds the provisioned value of the User ID Lockout period. The user can not be manually re-enabled by anyone during this waiting period.





## EMS-NE Logins

---

- Number of Channels**     The NE supports a maximum of 16 channels for multiple User login session associations with the OSs. Either one of the two (2) Super User logins may be used via both the EMS interface and the DCN between the NEs.
- The NE manages each login session independently and allows the user to obtain information regarding who is currently active on which channel for each of the NE's interfaces.
- Permitted Operations**     The NE allows the EMS Super User to:
- Create a user login
  - Modify the Super User's own password, another Super User's ID and/or password, and the existing non-Super User logins
  - Delete existing non-Super User logins
  - Assign initial user passwords for any new user login created
  - Change the password of any user ID
  - Disable and re-enable specific non-Super User logins
  - Provision the lockout threshold and period for all user logins
  - Provision password aging interval
  - Enable and disable the NE login security
  - Set inactivity timeout values
  - Globally set user login aging
  - Provision temporary login aging
  - Assign or modify user access privileges for non-Super User logins
  - Display all existing user logins and all currently active user login sessions, including the user access privileges



## EMS-NE Security Notification Management

---

**Database Changes**     The NE notifies the EMS whenever any of the following changes are made to an existing login:

- User ID
- User Access Privilege
- User ID Lockout Threshold,
- User ID Lockout Period
- Temporary Login Aging
- User Login Aging
- Password Aging
- Inactivity Timeout Period
- Last Login Time
- Last Logout Time
- User ID Status
- Last User ID Disabled Time

**Event Notifications**     The NE sends a notification, including the associated user ID, to the EMS whenever any of the following events occur:

- Login Creation
- Login Modification
- Login
- Logout
- Logout — Remote Link Down
- Intrusion Alert
- Logins Inhibited
- Logins Inhibited — Cleared

The User with proper privileges has access to the audit trail record, including security related alarms, events, and conditions.



## CIT-NE Login Security

---

|                           |                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>        | NE Login Security provides the ability to control access on a per NE basis by inhibiting all non-Super Users from logging into the NE. The two Super User Logins are not affected by this security measure and are always allowed to login.                                                                                                            |
| <b>Disabling Logins</b>   | <p>When the command is issued not to allow logins, all non-Super Users currently logged in are disconnected, and any attempt to log into the NE is denied.</p> <p>When logins are disabled, a logins disabled condition is raised by the NE and is recorded in the History Log. The NE-ACTY user panel LED is activated when logins are inhibited.</p> |
| <b>Re-Enabling Logins</b> | When logins are again enabled, the Logins Inhibited condition is cleared by the NE and logins inhibited-cleared is recorded in the History Log. The NE-ACTY user panel LED then deactivate unless activated by another condition.                                                                                                                      |
| <b>NE Reset</b>           | When a NE is reset, the NE Login Security Parameter values are retained.                                                                                                                                                                                                                                                                               |



## CIT-NE Inactivity Timeout

---

- Description** The NE maintains an Inactivity Timer for each user session via both the CIT-NE and EMS TL1 interfaces. If a user does not interact with the NE during a provisioned period of time, the user is automatically logged off from the NE and a Logout:user-id-timeout message is recorded in the History Log.
- Provisioning** The Inactivity Timeout value is provisioned on a per port basis for the CIT and EMS TL1 interface ports, and ranges from 0 minutes to 999 minutes. Setting the Timeout value to zero disables the feature. The original value is 30 minutes. All User Login association channel(s) via one of the two interface ports has the same provisioned Inactivity Timeout value for that specific port.
- Timer Activation** The Inactivity Timer is active only when there is an active login session on the channel and the NE is expecting the user to input data. The Inactivity Timer is activated when, at the completion of a user-generated command, there is no pending message being processed by the NE. There is no corresponding Inactivity Timer for the DCN interfaces.
- The Inactivity Timer is disabled whenever the NE is processing a command request.



## CIT-NE Password Aging

---

**Description** The NE requires users to periodically change passwords. If a user does not change their password within the provisioned period of time, their password expires. The next time the user attempts to log in to the NE, they will not be able to execute any commands until their password has been successfully changed.

**Password Aging Interval** The Password Aging Interval may be set to:

- Zero (0), which disables the feature, or
- Between seven (7) and 999 days

The Password is set for each user login. The original value is 30 days.

**Additional Constraints** When Password Aging is enabled, a user will not be able to change their password again until at least seven (7) calendar days have passed since the last time the password was successfully changed. If fewer than seven (7) calendar days have passed, any attempt to change the password will be denied.

**Important!** If Password Aging is disabled, passwords may be changed without any elapsed time restrictions.



## CIT-NE User Login Aging

---

**Description** If a non-Super User does not log in to the NE within the provisioned period of time, the login is deleted. As long as a user logs in more frequently than the provisioned value of this parameter, the login is retained.

Login aging applies only to non-Super-User logins, and the two Super User logins will never be deleted.

**Valid Values** A user with security administration privileges is able to globally set the login aging parameter to be between zero (0) and 999 days. A value of zero disables login aging. The original value is 120 days.

**Deleting a Login** When a login is deleted for inactivity, a login deleted: login-Id condition is recorded in the NE History Log.

**Temporary Login Aging** The NE allows a user with security administration privileges to create a temporary login. Temporary logins have a provisionable expiration date and are automatically deleted on the specified date, regardless of the frequency of use.



## CIT-NE Security Data Storage

---

**Description** All security data related to the NE or individual user logins is kept in non-volatile memory (NVM). This ensures that data is retained in the event of a system failure or shutdown. All security information, except passwords, can be printed, viewed, and accessed as Read Only by users with Security Administrative privileges.



## CIT-NE Audit Trail Record

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**History Log**    The NE retains a History Log which tracks:

- Login attempts, successful and failed
- Reason for denial, such as an invalid User ID and/or Password, association, or communication link failures
- User logouts
- Provisioning commands

**Logged Information**    All commands, except retrieve and test commands, log the following information:

- User ID
- Channel ID
- Time Stamp





## EMS TL1-NE Authentication and Access Control

---

|                            |                                                                                                                                                                                                                                         |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>         | The NE supports the same user login authentication and access control functions as those provided by the CIT for the EMS TL1 interface.                                                                                                 |
| <b>TL1 Logins</b>          | The NE supports a maximum of 16 TL1 login associations with the OSs via the EMS TL1 interface.                                                                                                                                          |
| <b>User Security</b>       | User security administration can be supported via both the EMS and CIT TL1 interface.                                                                                                                                                   |
| <b>Inactivity Timeout</b>  | The inactivity timeout feature can be disabled for the EMS TL1-NE interface.                                                                                                                                                            |
| <b>Password Aging</b>      | The password aging feature can be disabled for the TL1 interface.                                                                                                                                                                       |
| <b>Communications Link</b> | The communication link between the NE and EMS TL1 will remain active once established. An automatic login routine is used by EMS TL1 to re-establish the link each time the NE has been restored following an out-of-service condition. |







# 2      Operation Interfaces

## Overview

---

**Purpose**      This chapter describes the operation interfaces within the WaveStar® OLS 1.6T.

**Contents**

|                                                   |                      |
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| <a href="#">User Interface</a>                    | <a href="#">2-2</a>  |
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| <a href="#">User Panel</a>                        | <a href="#">2-5</a>  |
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| <a href="#">Miscellaneous Discrete Interfaces</a> | <a href="#">2-16</a> |
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| <a href="#">Miscellaneous Operation</a>           | <a href="#">2-23</a> |



# User Interface

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## User Interface (UI) Elements

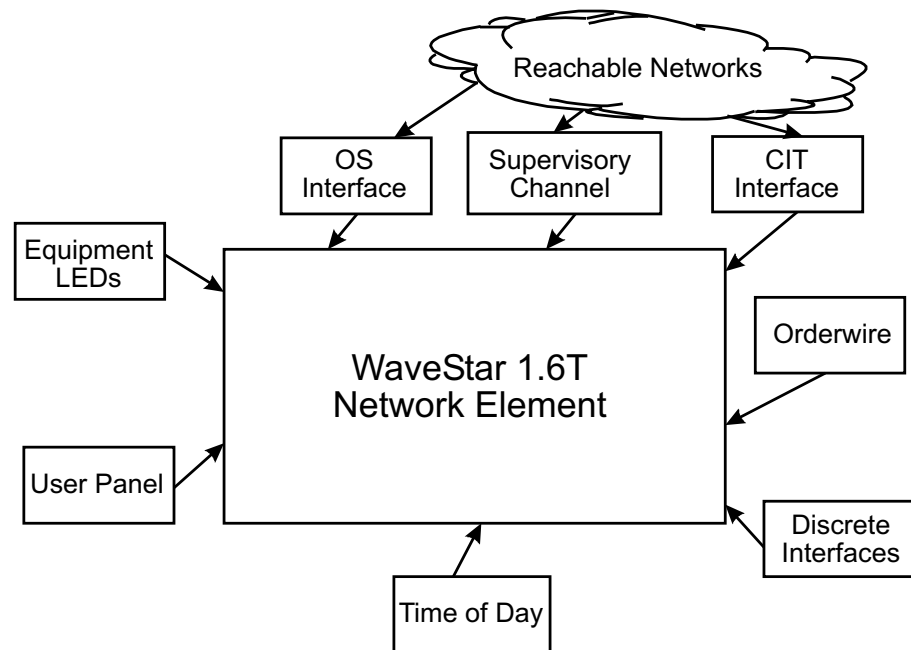
The WaveStar® OLS 1.6T system UI includes the following elements:

- User Panel
- Equipment LEDs
- OS Interface
- Supervisory Channel
- CIT Interface
- Orderwire
- Miscellaneous Discrete Interfaces
- Time of Day Clock

## Functional Block Diagram

The figure below shows a functional block diagram of the UI.

**Figure 2-1 Block Diagram of the UI**



## Network Definitions

The following definitions apply to the following discussions:

**Reachable Networks.** The "Reachable Network" is defined to be the set of NEs and/or Operating Systems (OSs) that can

exchange messages using the data links built into the NEs (LANs and Supervisory Data Links). This is equivalent to the OSI local routing area, and may include both Level 1 and Level 2 routing elements. There is only one Reachable Network defined from the perspective of a single NE. There may be physical links between different Reachable Networks, but from a messaging perspective, the networks are completely separate.

**Gateways.** A Gateway is defined to be a NE that provides a transport access function on behalf of a set of other NEs. The set of other NEs and the kinds of traffic being transported determine the type of Gateway. All NEs are capable of being generic message routing gateways. Some NEs may function as OS gateways due to their particular location (in the same office as OS).

**Applications.** For any application (for example, remote login) to operate successfully, the location originating the request and the destination of the request must be within the same Reachable Network. Some applications require the designation of a Gateway in order to function properly.

- Remote Maintenance

The WaveStar® OLS 1.6T includes remote maintenance capabilities that allow the CIT to access all NEs in a maintenance subnetwork. This enables all operation, administration, maintenance, and provisioning functions to be performed on any NE within a maintenance subnetwork from any NE within the same subnetwork. NE to NE communication is performed over the Supervisory Data Link.

- OS Maintenance

All NEs within a maintenance subnetwork are accessible via the EMS from any OS interface within the subnetwork. Routing of information is handled within the NE/OS interface software. Connectivity for all OS messages between NEs is through the Supervisory Data Links.

□

## External Interfaces

---

**Description** The table below lists and briefly describes those external interfaces with which the user interacts. The following sections describe in greater detail each of these elements.

**Table 2-1 External Interfaces**

| Interface           | Location                        | Interface Type           | Protocol                |
|---------------------|---------------------------------|--------------------------|-------------------------|
| User Panel Display  | External Interface Circuit Pack | 5 LEDs                   | ON/OFF                  |
| User Panel Control  | External Interface Circuit Pack | 2 Buttons                | ON/OFF                  |
| Office Alarms       | Interconnection Panel           | 1 15-Pin DSUB Connector  | Relay Closures          |
| Equipment LEDs      | Circuit Packs                   | 2 LEDs                   | ON/OFF                  |
| OS Interface        | Interconnection Panel           | 1 RJ-45 Connector        | 10BaseT                 |
| Orderwire           | Interconnection Panel           | 2 25-Pin DSUB Connectors | Clock, Tx Data, Rx Data |
| CIT Interface       | External Interface              | 1 RJ-45 Connector        | 10BaseT                 |
| Discrete Interfaces | Interconnection Panel           | 2 15-Pin DSUB Connectors | ON/OFF                  |
| Power Led           | Power Fibers                    | 1 LED                    | ON/OFF                  |



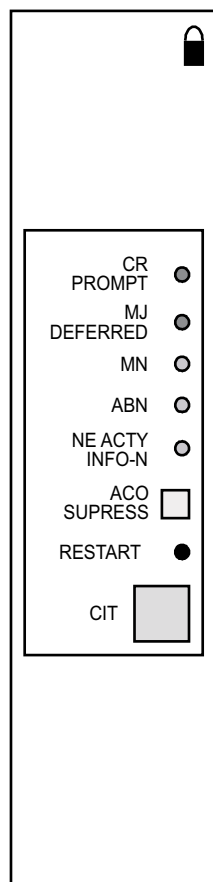
## User Panel

---

**Introduction** The User Panel has two control buttons/switches, three alarm indicators, and three status indicators. One control button silences office alarms, and the other restarts the system software. Alarm indicators display the highest severity level of the current alarm conditions. Status indicators display the status of the Alarm cut-off, the presence of abnormal conditions on the NE, and if there are any current alarm or status conditions on the NE.

**Diagram** The User Panel is located on the External Interface (EI) Circuit Pack and is visible from the front of the NE. [Figure 2-2, “WaveStar® OLS 1.6T User Panel” \(2-5\)](#), represents the External Interface User Panel. On an actual user panel, SONET labels are black, while SDH labels are shown in blue italics.

**Figure 2-2 WaveStar® OLS 1.6T User Panel**



**Control Buttons** Control buttons can be used to silence office alarms and restart the system software.

**Alarm Cut-Off (ACO)/Suppress**

The Alarm Cut-Off (ACO)/Suppress button turns off any audible office alarms. Once the ACO/Suppress button has been pressed, any subsequent alarmable conditions will activate the audible alarm again.

ACO alarm grouping prevents the dropping of the ACO for alarm and status conditions related to a particular object at a particular address. For example, if the user activates the ACO for a circuit pack failure condition, and then removes the circuit pack, the ACO should not drop when the alarm and status condition changes from **CP failure** to **CP removed**.

**Restart (Reset) Switch**

The Restart Switch restarts system software using the provisioned parameter values defined prior to the reset. A remote capability allows a Remote Reset to cause the local NE to Reset. This switch is recessed to avoid accidental activation.

**Alarm Indicators** LED indicators designate that the Critical Alarm, Major Alarm, or Minor Alarm is active (including alarm testing) in the SONET environment. These LEDs are also used to indicate that the Prompt Alarm or Deferred Alarm is active (including alarm testing) in the SDH environment. The office audible and visual alarms are activated when any one of these indicators is activated.

**Critical Alarm/Prompt Alarm**

In the SONET environment, Critical Alarms indicate that a severe, service-affecting condition has occurred and immediate corrective action is imperative regardless of the time of day or day of week.

In the SDH environment, Prompt Maintenance Alarm (PMA) is generated to initiate activities (normally immediately) by maintenance personnel to remove defective equipment in order to restore good service and repair the failed equipment.

This LED is red and is labeled **CR/Prompt**.

**Major Alarm/Deferred Alarm**

In the SONET environment, major alarms are used for hardware or software conditions that indicate a serious disruption of service or the malfunctioning or failure of important circuits. These troubles require



the immediate attention and response of maintenance personnel to restore or maintain system capability. The urgency is less than in critical situations because of a less immediate or impending effect on service or system performance.

In the SDH environment, Deferred Maintenance Alarm (DMA) is generated when immediate action is not required by maintenance personnel. For example,

- when performance falls below a set threshold, but the effect does not warrant removal from service
- when automatic changeover to stand-by equipment has been used to restore service

This LED is red, and is labeled ***MJ/Deferred***.

### **Minor Alarm**

Minor alarms are defined only in the SONET environment and are used for troubles that do not have a serious effect on service to customers or for troubles in circuits that are not essential to NE operation.

This LED is yellow and is labeled ***MN***.

## **Status Indicators**

Status indicator buttons alert the user of retired office audible alarms, alarm conditions, and abnormal system conditions

### **Alarm Cut-Off/Suppress LED**

When lit, the green Alarm Cut-Off/Suppress LED indicates that an alarm condition exists, but the audible alert associated with the condition has been turned off. The LED is labeled ***ACO Suppress***.

### **Abnormal/Abnormal LED**

When lit, this yellow LED indicates an abnormal condition within the system. These conditions include maintenance activity on any NE within the system which could potentially cause service affecting failures if additional craft activity is performed within the system. The LED is labeled ***ABN/Abnormal***. Some examples of abnormal conditions are:

FMM removal enable

Office Alarm disabled

Test Alarm in progress

**Activity-Near-End/Info-N Indicator**

When lit, this yellow LED indicates that there is an alarm or status condition active on the local NE. This would include any condition identified, regardless of the alarm level. An alarm condition is one with a severity attribute of Critical (CR), Major (MJ), Minor (MN), Prompt, or Deferred. A status condition is one with an alarm attribute of NA, NR, No\_Alarm, or No\_Report. The NE-ACTY LED is lighted for both types of conditions.

**Flashing LEDs**

During initial software installation and when circuit packs are inserted into a running system, there will be an automatic upgrade of the firmware on the circuit packs to the latest version. Flashing green LEDs on the circuit pack faceplates will indicate that the upgrade is occurring (typically less than 30 seconds). Please DO NOT remove the circuit pack during this upgrade. Removing the circuit pack during upgrade may cause damage to the affected pack. When the pack LEDs stop flashing, you can remove the packs or power down the system as needed.



## Power On LED

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**Location** A green Light Emitting Diode (LED), labeled **PWR OUTPUT**, is located on each power filter on each shelf within a NE. When lit, this LED indicates that the corresponding filter is powered on. Each shelf has two (2) power filters.

**Operation** The Power-On LED is extinguished:

- when power is not supplied through the filter to the shelf, OR
- if the low-voltage shutdown feature located on the power filter is activated, which then turns off power to the shelf

Monitor points on the power filters allow the incoming voltage to the filter to be measured.



## Equipment LEDs

---

**Fault LED (FAULT)** When continuously lit, this red LED indicates either a failure of its associated circuit pack or an on-board power failure. When flashing, it indicates a failure of an input to the associated circuit pack. The LED is labeled **FAULT**.

**Circuit Pack Active LED (ACTIVE)** When lit, this green LED indicates that the circuit pack is powered and is in the active state. The LED is labeled **ACTIVE**.

**ACTIVE LED as Not-In-Service Indicator** The WaveStar® OLS 1.6T software allows the Active LED (Green LED) on any circuit pack to be extinguished by issuing the appropriate command from the OS or the WaveStar® OLS 1.6T CIT. When issued, the corresponding slot declares a **cp not-in-service indicated** condition. The state of this LED remains independent of any other state of the NE until the appropriate command is issued to indicate that the circuit pack has returned to service, and a **cp not-in-service indicated — cleared** event is declared and the LED comes on.

A separate command is issued to determine all circuit packs indicating a **not-in-service** condition. A user can, then, remove the circuit from service on the system, and physically, remove and/or replace it without affecting service.

**Fault/Active LED Behavior** The following describes the sequence of events that occur during a Circuit Pack and NE software boot cycle.

### During Circuit Pack Software Boot Cycle

Circuit pack software starts when any circuit pack, except the BOS/SYSCTL, is inserted into a running NE. The sequence of events

is listed below. Each step begins only after the preceding one is completed.

1. The FAULT LED is on as the on-board software is loaded.
2. The ACTIVE LED lights when the software download to the circuit pack is completed and the software starts running. The LED remains lit as long as the bay is powered.
3. After the on-board software has been loaded, the FAULT LED remains on as the NE software is loaded. After the software is loaded and running, and determines the circuit pack is good, the FAULT LED extinguishes. If the circuit pack is faulty, the FAULT LED remains lit. If the software determines the circuit pack is good, but the incoming signal is determined to be failed, the FAULT LED begins to flash.  
The circuit pack is reported as booting as soon as it is inserted, and the FAULT LED lights. The circuit pack booting condition is cleared as soon as the circuit pack is determined to be good. There is no alarm clear delay for equipment faults.

#### During NE Software Boot Cycle

NE software boots when:

- office power is applied to the bay containing the BOS/SYSCTL circuit pack
- when the BOS/SYSCTL circuit pack is inserted, or
- when the user initiates a software restart with a command or push button

The **FAULT** LED and the **ACTIVE** LED behave as follows during a NE software boot:

1. The FAULT LED on the BOS/SYSCTL is on as the on-board software is loaded.
2. The ACTIVE LED on the BOS/SYSCTL lights when the software download to that circuit pack is completed and the software starts running. It remains lit until the NE software starts again or until the bay loses power. The FAULT LED on each of the BOS/BAYCTL and BOS/OCHCTL circuit packs lights when their on-board software begins to load.

3. The ACTIVE LED on each of the BOS/BAYCTL and BOS/OCHCTL circuit packs lights when the software download to that circuit pack is completed and the software starts running. It remains lit until the NE software starts again or until the bay loses power. The FAULT LED on each of the remaining circuit packs lights turns on as their on-board software is loaded.
4. The ACTIVE LED on each of the remaining circuit packs lights when the software download to that circuit pack is completed and the software starts running. It remains lit until the NE software starts again or until the bay loses power.
5. The FAULT LED on each circuit pack is extinguished when the Fault software resumes. If the circuit pack is faulty, it remains lit. If the circuit pack is good, but the incoming signal is determined to be failed, the FAULT LED begins to flash.



## CIT-PC Interface

---

- Provisioning** All externally provisionable parameters may be set using the WaveStar® OLS 1.6T CIT. The CIT provides the capability of copying provisionable parameters from one NE on the subnetwork to another NE on the subnetwork,, including the parameter that distinguishes between the SONET and SDH environments for setting alarm levels.
- Maintenance** The user may perform maintenance functions from the WaveStar® OLS 1.6T CIT such as:
- initiate an alarm cut-off
  - restart and initialize software
  - inhibit alarms to the Office Alarm Grid, OS, and telemetry interfaces, either as a whole or separately
  - operate/release external controls
  - operate/release the Not-In-Service indicator
- Reports** The following reports are available to the WaveStar® OLS 1.6T CIT:
- Autonomous condition reports
  - On-demand retrieval operations
  - All alarm reports within the maintenance subnetwork
  - Log retrieval reports
- The date format for all reports is provisionable to distinguish between SONET (YY-MM-DD) and SDH (DD-MM-YY) environments.
- Testing** The WaveStar® OLS 1.6T CIT is capable of performing the following tests:
- NE self tests using the TEST-AUTO-LOCAL command.
  - LED tests, which apply to LEDs on all circuit packs and equipment, using the TEST-LED command. When activated, all LEDs turn ON for 10 seconds, OFF for 10 seconds, and return to normal operation.

- Office alarm tests to determine the proper operation of Office Alarm Interfaces for the NE. The TEST-ALM command is used.
- Momentarily (300 ms) or continuously activate and release miscellaneous discrete control points using the OPR/RLS-EXT-CONT command.





# Office Alarms

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## **Interfaces**      CR/Prompt, MJ/Prompt, MN/Deferred Alarms

There is a set of contact closures for CR/Prompt, MJ/Deferred, and MN alarms, for both audible and visual alarms. When multiple conditions with two or more different alarm attributes are active, only the highest level alarm will be active (both audible and visual). When the highest severity alarm has been cleared, the next highest alarm, if any, will be activated (both audible and visual).

### **Contact Closures**

Alarm relays are in a closed state when the corresponding alarms are activated, and are open when the alarm is cleared.

### **CR/Prompt, MJ/Prompt, and MN/Deferred Fail Safe**

The CR/Prompt and MJ/Deferred alarm relays have normally closed contacts so that in the event of a total power failure to the controller shelf, the relays will close and result in dual local office alarms. The MN alarm relay has normally open contacts.

## **Operational Capabilities**      Clearing Alarms

If all previous alarms have been silenced via Alarm CutOff (ACO) (audible indication only) and if a new alarm condition occurs, the ACO will be cleared and the highest level alarm activated.

### **Alarm Suppression**

Alarm relay contact closures may be isolated from the Office Alarm Grid/Station to permit maintenance activities on the NE without activating new alarms. Suppression of alarm indications to the OS interfaces is also supported.

### **Functional Testing**

The WaveStar® OLS 1.6T terminals provide the ability to exercise the functioning of audible and visual alarms. When the test is initiated, the LED alarm indications on the NE light, and the alarm relays on the NE operate, causing local office audible and visual alarms to activate. Any single alarm, or all alarms, may be exercised. The number of times the alarms can be exercised is selectable from between one and ten times.



# Miscellaneous Discrete Interfaces

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**Overview** The WaveStar® OLS 1.6T system offers Miscellaneous Discrete Interfaces (MDI).

## Inputs

Contact closures from external switches and/or relays are connected across the input environmental points.

## Outputs

Output control points are contact closures.

## Physical Locations

The Miscellaneous Discrete Interfaces reside within the NE

## Internal Environmental and Control Points

### Number of Interface Points

The WaveStar® OLS 1.6T system NEs provide 16 internal miscellaneous discrete environmental input points, and four internal miscellaneous discrete control output points.

### MDI Input Operation

The WaveStar® OLS 1.6T system senses any individual contact closure for the environmental input points, and notifies the OS/CIT with an appropriate message that has been provisioned.

### MDI Output Operation

The OS/CIT activates/releases any control output point.

### MDI Labeling

Each point is uniquely labeled by the software for OS/CIT requests, responses, and notifications.

## Provisioning Environmental and Control Points

### Provisionable Alarm Levels

The alarm severity level for each of the miscellaneous discrete environmental points is provisionable.

**Operational Capabilities**

The following capabilities are available:

- The state of the environmental points is available as message-based OS messages and are reported on demand at the CIT and OS Interfaces.
- The control points are operated and released from the CIT and OS interface.
- If the NE experiences a RESET, the states of the environmental and control points remain unaffected.
- All discretes are provisioned with their values upon initialization. Alarms are given an original value of MN.
- When an environmental point is activated, a notification is sent to the OS. When the point returns to its initial state, a notification is sent to the OS.



## TL/1 OS Interface

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**Commands** The WaveStar® OLS 1.6T has a TL/1 application level OS port interface with a full set of TL1 OS commands.

**Important!** There may be more than one OS-NE TL1 interface. NEs within a maintenance subnetwork directly connected to the OS are called ***Points of Attachment***.

**Communications and Application Protocols** The WaveStar® OLS 1.6T OS port TL1 interface is transported over the network as follows:

---

- 1 The Interface communications protocol is OSI or TCP/IP.

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- 2 The Interface application (message) protocol is the full set of 1.6T TL1 messages. This includes both input commands and responses (solicited outputs), and autonomous outputs (alarms and events).

---

- 3 The message interface provides proper syntax and error checking of TL1 commands that have been input.

### NE-to-NE Interworking

NE-to-NE communications are implemented over the Supervisory Data Link. Remote maintenance activity, OS communications through the Point of Attachment, remote alarm and activity condition reporting, and system provisioning use the communication channel capability in the Supervisory Data Link to interwork NEs.

### Point of Attachment

Since any WaveStar® OLS 1.6T terminal can connect to the OS through the OS interface, any 1.6T terminal within a maintenance subnetwork can be a Point of Attachment. Repeaters, however, cannot be a Point of Attachment.

The Point of Attachment supports a TID/NSAP mapper to allow the routing of messages to other NEs via TL1 over TCP/IP interface in a maintenance subnetwork. The OS messages use TIDs to designate the destination NE, but NSAP addresses are used within the OSI-based Supervisory Data Link.

An ENT-SYS (or PROV-SYS) command must be used to provision the TCP/IP parameters if operations is on a TCP/IP network. ENT-OSI (or PROV-SYS) must be used to provision the OSI parameters in the NE. The ENT-SYS (or PROV-SYS) and ENT-OSI (or PROV-SYS) commands can be executed from a CIT connected anywhere within the maintenance subnetwork. No other provisioning of a Point of Attachment is required.

### **Message Handling in Subnetworks**

Once Login Session interaction between the OS and NE has been established (using the ACT-USER TL/1 command), autonomous TL/1 messages from the NE to the OS can be allowed or inhibited at a login session basis only, not on a NE-wide basis.



## Orderwire

---

|                        |                                                                                                                                                                                                                                                                                                    |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Purpose</b>         | There are three Orderwire circuits, each operating at 64 kb/s. These circuits are provided to the user via two connectors on the Interconnection Panel.                                                                                                                                            |
| <b>External Access</b> | <p>The Orderwire functionality is provided by an external orderwire shelf. The interface to the shelf is provided through the interconnect panel.</p> <p>Features and functionality for the orderwire are provided through an external orderwire terminal, such as the Dantel Orderwire Shelf.</p> |
| <b>Signals</b>         | The appropriate signals, such as transmit clock, transmit data, receive clock, and receive data, are provided to the external shelf in order to implement the full complement of orderwires.                                                                                                       |
| <b>Provisioning</b>    | Each Orderwire can be provisioned to be either express or local at each NE as required. Each orderwire is initially provisioned to be local.                                                                                                                                                       |



## Supervisory Channel

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**Purpose** The Supervisory Channel provides the communication channel between End Terminals, Repeater Sites, Full WAD Sites, and Limited WAD Sites. A CEPT1 (2048 kb/s signal, 30-64 kb/s channels) is used for the Supervisory Signal carried on a 1510 nm optical signal.

**Operation** The Supervisory Signal operates as follows:

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- 1 There are up to two Supervisory (SUPVY) Signal provided for each DWDM system.

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- 2 The SUPVY Signal carries the following components:
  1. **Two SUPVY Data Links (DL) operating at 768 kb/s each.** These data links are used for message-based control system communications between NEs. One data link is terminated at each NE. The other data link is provisionable, and can terminate at specific NEs and express through other NEs.
  2. **Three Orderwire circuits operating at 64 kb/s each.** These circuits are provided to the user via connectors on the Interconnect Panel. Each Orderwire is provisionable to be express or local, based on local requirements.
  3. **Three channels of 64 kb/s each** are reserved for future use.

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- 3 The SUPVY Signal operates at a rate of 2.048 Mb/s and is formatted according to the standards for an E1 signal with respect to framing, CRC error monitoring, and channel numbering (time slot assignments).

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- 4 The individual SUPVY Signals are not protected at this time.

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- 5 The fixed and provisionable SUPVY Data Links are not protected at the physical layer. The message traffic passing through a given SUPVY DL is protected by the routing software of the OSI or other communications protocol stack.

**Interface**

The Supervisory Signal terminates on the SUPVY circuit pack plug-in. Up to two Tx and two Rx terminations can be accommodated within a single SUPVY plug-in. In 2-fiber applications, 1 Tx and 1 Rx terminal serves End Terminals. At Repeater Sites, Full WAD sites, and Limited WAD sites, 2 Tx and 2 Rx are needed.





## Miscellaneous Operation

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**Time of Day Clock**    The WaveStar® OLS 1.6T maintains a Date and Time of Day clock.

**Purpose**

This clock is used to time stamp events, such as the reporting and clearing of alarm conditions, and interactions with the OS.

**Setting Date and Time**

The Date and Time are set via the CIT/OS.







# 3 WaveStar® OLS 1.6T CIT

## Overview

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**Purpose** This chapter provides information on the hardware and software requirements for Lucent Technologies' WaveStar® OLS 1.6T CIT application software. It also provides an overview of the WaveStar® OLS 1.6T CIT and location of the interactive tutorial.

**Related Information** The following documents provide related information:

- *Software Release Description* (Comcode 109154401)
- *Operations Systems Engineering Guide* (365-575-716R6.2)

### Contents

|                                                     |                     |
|-----------------------------------------------------|---------------------|
| <a href="#">WaveStar® OLS 1.6T CIT Requirements</a> | <a href="#">3-2</a> |
| <a href="#">WaveStar® OLS 1.6T CIT Tutorial</a>     | <a href="#">3-4</a> |



# WaveStar® OLS 1.6T CIT Requirements

---

**PC Requirements** Most customers dedicate a lap-top personal computer (PC) to run the WaveStar® OLS 1.6T CIT applications software. However, a properly configured PC will also suffice. See the ***Software Release Description*** for the requirements for the customer-provided PC.

A WaveStar® OLS 1.6T PC may be loaded with multiple and different releases of the CIT application software. This may be necessary when using a single PC to connect to multiple spans or systems that are using different releases of NE software, or to multiple/different WaveStar® OLS 1.6T products. However, multiple versions of the CIT will **not** run at the same time. One version must be exited prior to starting another version. The WaveStar® OLS 1.6T CIT application software is only available on CD-ROM media.

## WaveStar® OLS 1.6T CIT Applications Software Overview

Some service providers prefer to centralize most of their network operations and to have those centralized functions performed at a work center.

Provisioning, alarm analysis, and trouble shooting, are three functions that may be centralized. Only those functions that require actual changes to the hardware are decentralized (for example, installation and repair).

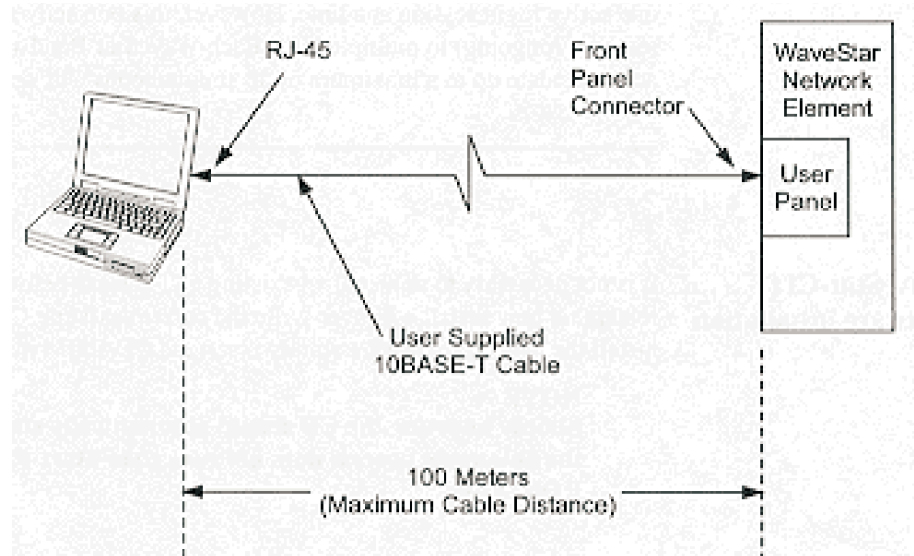
## Communication

The PC connects to the WaveStar® OLS 1.6T network via a 10 Base-T LAN cable. The figure below depicts a direct connection using a short cable (cross-over cable) to connect directly into the front of the user panel. The communication protocol between the WaveStar® OLS 1.6T CIT and the NE is mostly the TL1 messages.

In addition to the CIT direct connection to the NE, the WaveStar® OLS 1.6T CIT supports the remote access to the NEs that are connected in the maintenance sub network via both a dial-up and direct LAN connection. The CIT remote dial-up and direct LAN

access are supported only via the OS LAN port of the NE. The OS LAN port supports a 10 Base T physical interface.

**Figure 3-1 WaveStar® OLS 1.6T CIT with Direct Connection to the NE User Panel**



□

## WaveStar® OLS 1.6T CIT Tutorial

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**Tutorial** A detailed interactive tutorial can be found on the WaveStar® OLS 1.6T NE and CIT CD-ROM.





# 4 Provisioning

## Overview

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**Purpose** Provisioning is the assigning of values to parameters used by network elements for specific functions. This chapter describes the principles of provisioning the WaveStar® OLS 1.6T. Procedures for specific provisioning tasks are documented in Chapters 9-14 of this manual, as well as in the WaveStar® OLS 1.6T Installation Guide (365-575-717R6.2).

**Contents**

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|----------------------------------------------------------------|----------------------|
| <a href="#">Introduction to Provisioning</a>                   | <a href="#">4-2</a>  |
| <a href="#">OTU Port-Provisioning</a>                          | <a href="#">4-3</a>  |
| <a href="#">Technical Provisioning</a>                         | <a href="#">4-5</a>  |
| <a href="#">Provisioning Interactions with Maintenance</a>     | <a href="#">4-6</a>  |
| <a href="#">Provisioning Guidelines</a>                        | <a href="#">4-8</a>  |
| <a href="#">Using the CIT to Provision Circuit Connections</a> | <a href="#">4-10</a> |



# Introduction to Provisioning

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**What is Provisioning?** Provisioning is the process of assigning values to parameters in memory which determine the operating characteristics of the system. Each provisionable parameter has a factory supplied original value when software is first loaded into a Network Element (NE). These values become the current value upon launching the software. The current values are the values used by the system.

**Methods of Provisioning** There are two methods of provisioning that are distinguished from one another by the ways in which they are done and undone:

- **Auto-Provisioning** — Done by adding good signals to the NE; undone (changing a value) by changing the signals that are applied to the network element, and then executing the UPDATE function.
- **Technical Provisioning** — Done by entering provisioning commands; undone by repeating the previous provisioning operation using a different value.

**Provisioning Inconsistencies** Some combinations of parameter values that are set using Technical Provisioning may be mutually incompatible. Although Technical Provisioning commands are not denied if they would result in a provisioning inconsistency, these inconsistencies are reported with appropriate alarms and reports. The user is then directed by the Trouble Clearing Procedures to clear the condition by changing one or more of the affected parameter values.





## OTU Port-Provisioning

---

**Description** The only auto-provisionable WaveStar® OLS 1.6T ports are OTU IN and client ORS IN ports with associations indicating that they receive their inputs directly from sources outside the network element, and that also have the corresponding OTU OUT or ORS OUT ports involved in a supported type of association. Port provisioning involves both auto-provisioning and technical-provisioning as described in a later section.

**Port Auto-Provisioning** There are three possible port states:

- Automatic
- Monitored
- Not Monitored

Auto-provisioning of the OTU IN ports is described here:

- The original value of each OTU IN port is Automatic.
- An Automatic port becomes Monitored when a good signal is found to be present.
- A Monitored port becomes Automatic when UPDATE is executed if a good signal is not present.
- An Automatic or Monitored port becomes Not Monitored when set to that value by executing the technical provisioning command ENT-OTPS.
- A Monitored or Not Monitored port becomes Automatic when set to that value by executing the technical provisioning command ENT-OTPS.
- A port becomes Automatic when either of the associations involving the port is deleted by the DLT-ASSOC-OTU command.
- If a good incoming signal is present at a port when the appropriate associations are entered, the port immediately becomes Monitored.

If a terminating circuit pack is faulty or has been removed, an Automatic port will not become Monitored regardless of the state of the incoming signal, and UPDATE causes no change to that slot's associated port states. This means that a failed circuit pack never updates the database. Technical provisioning commands (ENT-OTPS) can still set a port to Automatic or Not Monitored at any time,

regardless of the health or auto-provisioned state of the terminating slot. Not Monitored ports are not affected by the UPDATE command.



## Technical Provisioning

---

**Description** Technical Provisioning is the process by which system parameters are set (provisioned) using a series of user-entered commands.

All technical provisionable parameters, their allowed values, and their original values are documented in the applicable TL1 command pages found in the *WaveStar® OLS 1.6T Operations System Engineering Guide* (365-575-716R6.2).



## Provisioning Interactions with Maintenance

---

**Instantiating Slots** Maintenance activities are affected by Network Element Type (NETYPE) provisioning and OTPS provisioning. Specifically, common slots are instantiated by provisioning the NETYPE, and per-channel slots are instantiated by provisioning OTPS associations.

The following slots are instantiated by the NETYPE parameter:

- BOS — System Controller
- BOS — Overhead Controller
- EI
- OA
- ODU1, ODU1C, ODU21
- OMON
- OMU1, OMU1L
- SUPVY
- WAD
- BOS — Bay Controller in bays containing any of the above circuit packs.

The following slots are instantiated by OTPS associations:

- ODU2, ODU2C, ODU3, ODU22
- OMU2
- ORS
- OTU
- BOS — Bay Controller in those bays containing any of these circuit packs, but none of those packs listed in the NETYPE list.

**Maintenance Implications** Refer to [Table 4-1, “Slot-Related Reports Affected by NETYPE and OTPS Associations” \(4-7\)](#) for information about how the instantiation of slots by the two kinds of provisioning affects Retrieve-Equipment and Retrieve-Alarm reports.

**Table 4-1 Slot-Related Reports Affected by NETYPE and OTPS Associations**

| Report                                | Common Slots | Slots That Can Be Addressed by OTPS Associations |                | Other Slots |
|---------------------------------------|--------------|--------------------------------------------------|----------------|-------------|
|                                       |              | Association Exists                               | No Association |             |
| RTRV-EQPT: reports slot if CP present | YES          | YES                                              | YES            | no          |
| RTRV-EQPT: reports slot if CP absent  | no           | no                                               | no             | no          |
| RTRV-ALM: CP removed                  | YES          | YES                                              | no             | no          |
| RTRV-ALM: CP failed                   | YES          | YES                                              | YES            | no          |
| RTRV-ALM: unexpected CP type          | YES          | YES                                              | YES            | no          |
| RTRV-ALM:CP (unknown type) removed    | no           | no                                               | no             | no          |
| RTRV-ALM: CP (unknown type) failure   | YES          | YES                                              | YES            | no          |
| RTRV-ALM: no CP expected in slot      | no           | no                                               | no             | YES         |

### Incoming Signal Maintenance

OTU IN and client ORS IN ports receiving inputs (from an external source) are the only auto-provisioned entities within the system. All other entities are provisioned by technical-provisioning. Maintenance of signals from the outside world is controlled by OTU IN port states. Maintenance of signals between common slots is controlled by the provisioned NETYPE. Maintenance of signals going to and/or coming from slots that are created by OTPS Associations is controlled by the presence or absence of OTPS associations.



## Provisioning Guidelines

---

### Parameters to Provision for Network Partitioning

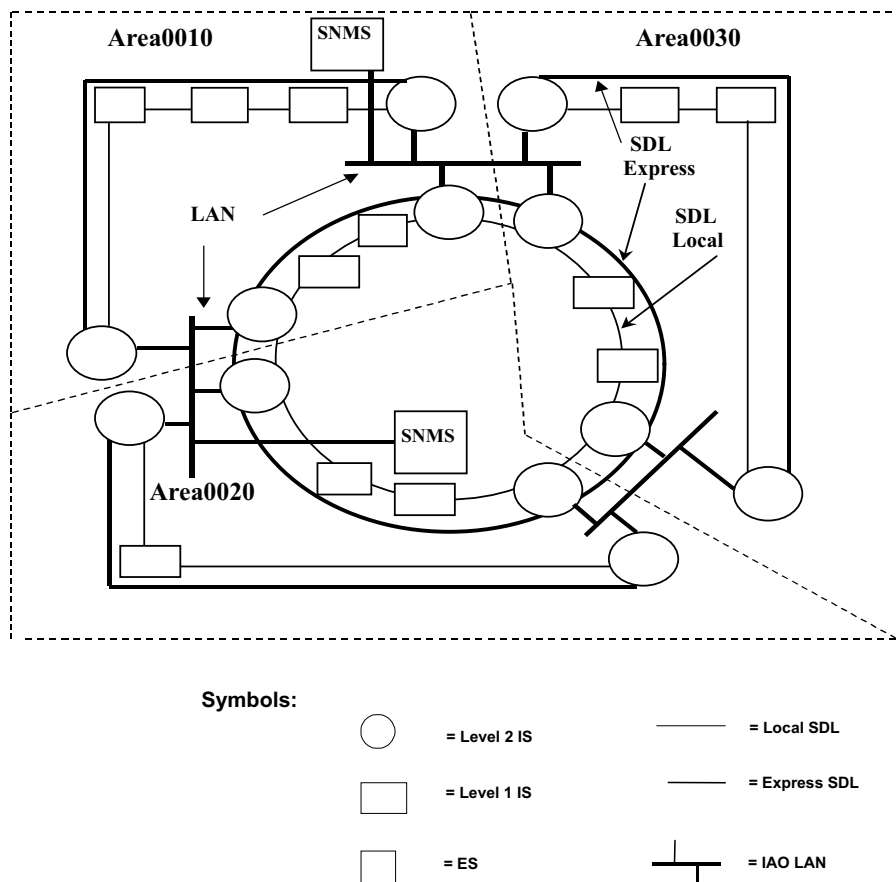
The user must have knowledge of the capability limits for partitioning large networks to properly plan and engineer the provisioning of Level 2 Intermediate Systems (ISs) and area addresses of the Network Service Access Points (NSAPs). The following provides a summary of the WaveStar® OLS 1.6T provisionable parameters and the associated network limit capability:

- **NSAP Provisioning** - The WaveStar® OLS 1.6T uses a variable length area address. The user can provision the area address portion of the NSAP for the routing purpose. Changing the value of the NSAP is a provisioning change, but can affect communications within a subnetwork. The ENT-OSI (or PROV-SYS) is used for provisioning the area address (for example, LOCALADDRESS parameter in TL1) portion of the NSAP. Execution of this command resets the overhead controller of the Terminal or reboot the system controller in the case of the Repeater.
- **Express and Local Supervisory Data Link (SDL) Provisioning** - Each local SDL must be terminated at each Level 1 IS node and express SDL may be used to connect the Level 2 nodes to establish adjacency with each other by skipping the nodes between them to form a single Level 2 domain as illustrated in [Figure 4-1, “Use of Express Datalink to form a Single Level 2 Routing Domain” \(4-9\)](#). The use of the express SDL can significantly reduce the number of hops between the nodes by skipping the Level 1 nodes in between. The ENT-SUPR is used to provision the local and express SDLs in a specified network element.

[Figure 4-1, “Use of Express Datalink to form a Single Level 2 Routing Domain” \(4-9\)](#) below shows two (2) SNMS systems connected to an OLS network which has been configured into three (3) separate OSI areas. All Level 1 nodes are connected via the local

SDL and all Level 2 nodes are joined together via the express SDL to form a single Level 2 domain

**Figure 4-1 Use of Express Datalink to form a Single Level 2 Routing Domain**



### Parameters, Values, and Limits

Refer to the *WaveStar® OLS 1.6T Operations Systems Engineering Guide* (365-575-716R6.2) for detailed information on the input and output parameters of the TL1 messages supported by the NE. Refer to the *WaveStar OLS 1.6T Installation Manual* (365-575-717R6.2) for actual instructions on how to provision a WaveStar OLS.

□

## Using the CIT to Provision Circuit Connections

---

**Add/Drop Optical Channels** As noted previously, provisioning is the assigning of values to parameters used by network elements for specific functions. Within the WaveStar® OLS 1.6T system, the CIT is used to create associations to add/drop wavelengths to/from OTUs and through-OTUs in the system. Refer to Chapter 11, [Circuit Order Tasks](#), for procedures on how to add or delete optical channels. A tutorial for the CIT may be found in the online help that accompanies this optical product. The following provides a high-level summary of CIT provisioning functions.

There are three main types of Circuit Connection operations: ***Creating a New Circuit Connection***; ***Removing an Existing Circuit Connection***, and ***Viewing an Existing Circuit Connection***.

To create a circuit, it is necessary to create associations between the various pieces of equipment that comprise the circuit. The CIT provides a step-by-step equipment selection process for creating these associations. The user is prompted to select the first piece of equipment in the circuit and is then subsequently prompted to select each additional piece of equipment until a complete circuit has been created. The tool that the CIT provides to perform this function is the Circuit Connection Wizard. The Wizard enables the user to only select equipment that is compatible with the previous equipment selection, thus ensuring compatible circuit types.

The CIT also provides the capability of creating associations using the “cut -through” mode. In cut-through mode, the user needs to use TL1 commands to create circuit associations.

The Circuit Connection provisioning operation is a three-part process: Software Provisioning Interaction between the CIT and the NE, Verification process utilizing Optical Power readings to verify software interaction was successful, and the actual physical connection of fiber between circuit packs.

The Software Provisioning Interaction is done by the Circuit Connection Wizard. The result of this provisioning is to activate the laser in the OTU. With no input to the OTU the output of a provisioned OTU will be an Alarm Indication Signal (AIS). More information on AIS is provided in [Chapter 5, “Performance Monitoring”](#).







# 5 Performance Monitoring

## Overview

---

**Purpose** The WaveStar® OLS 1.6T system performance monitoring philosophy includes proactive maintenance (performance management). The system detects and reports performance degradation before it deteriorates further and causes service-affecting alarm conditions.

**Features** The WaveStar® OLS 1.6T system provides the following performance monitoring features:

- OTU performance parameter monitoring
- Strong Forward Error Correction digital parameter monitoring
- Support for Supervisory Channel E-1 format digital parameters
- Setting of high and low thresholds associated with provisionable PM parameters
- Retrieve thresholds (high or low) associated with provisionable PM parameters
- Transmit Threshold Crossing Alerts (TCAs)/Quality of Service (QOS) warning messages autonomously
- Clear Threshold Crossing Alerts/warning messages
- Retrieve PM and threshold data per accumulation time intervals
- Specify date and time of day clocks for performance monitoring
- Initialize PM registers associated with all digital parameters
- Monitor and report per channel PM data

- Optical signal power parameters for OLIN, SUPR, and OCHAN
- TCA/QOS alarm messages retrievable using RTRV-LOG/TL1
- Multiple thresholds (high and low) for analog parameters

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# Performance Measurements

## Overview

---

**Purpose** This section provides information on the various circuit pack performance measurements.

**Description** The WaveStar OLS 1.6T System measures optical signal power degradation and equipment aging and/or failures at various input/output levels by circuit packs/devices. For example:

- The OA circuit pack measures performance for the optical line as well as the optical parameters for the Supervisory (SUPVY) Signal
- The OMON circuit pack monitors the performance for each optical channel
- The OTU circuit pack monitors the SONET/SDH B1 parity errors for the incoming OC-48/STM-16 and OC-192/STM-64 signals
- The SUPVY circuit pack monitors the performance of the Supervisory Channels

**Circuit Pack Removal** Once a circuit pack has been removed, digital performance data that has been stored and that is associated with the removed circuit pack is discarded by the system.

**PM Response for Current Data** Any time the PM response for current data does not match the current date and time, there is a reason for this anomaly. The PM response for current data has the date and time set to the date and time when the current bin started (beginning of monitored time). If the network element date or time is changed somewhere around the boundary of the bin roll over, the current bin will roll over only at the end of the next time period. For digital parameters, this is evident if the monstat is set to PRTL. There is no way of identifying this for analog parameters.

If the System Date is changed the PM current bin values are disrupted. PM current bins will report correct values only after the

end of the next time period. For further confirmation, please do a  
RTRV-LOG/TL1.



## OA Circuit Pack Performance Measurements

---

**Introduction** The Optical Amplifier (OA) circuit packs have on-board pump lasers which amplify the multi-wavelength signal for transmission onto the optical fiber. Each OA provides uniform gain for each operating channel independent of the number of channels in use, or the bit rate of the channel.

The OA circuit pack checks:

- the total input power to the OA for detection of line failures
- the total output power of the OA for detection of OA failures
- the efficiency of the OA pump lasers for performance degradation

**Important!** The SUPVY Signal does not appear on either the MON RX port or the MON TX port on the OA. The Optical Monitoring Ports (MON RX, MON TX) on the OA allow per-channel monitors by either connecting a separate OMON circuit pack or by connecting an Optical Spectrum Analyzer (OSA) provided by the customer.

**Monitored Parameters** Parameters that are monitored and measured at the OA packs are:

- Total input Optical Power Received (TOPR-OL)
- Total output Optical Power Transmitted (TOPT-OL)
- Pump Laser Efficiency — Receive Pump 1 through 6 (PLE-RP1-6)
- Pump Laser Efficiency — Transmit Pump 1 through 6 (PLE-TP1-6)
- Signal Power Received by Supervisory Channels (SPR-SU)
- Signal Power Transmitted by Supervisory (SPT-SU)



## SUPVY Circuit Pack Performance Measurements

---

**Introduction** The SUPVY circuit pack taps and measures the Supervisory Channels sent between OAs. Supervisory Channel inputs and outputs are provided on the OA which allows the user to provide remote system operations, such as performance maintenance and provisioning. These activities are performed using TL1 commands through an OS or local Craft Interface Terminal (CIT) using a personal computer.

**Monitored Parameters** The following Digital Parity Errors are monitored and reported for Supervisory Signals:

- Cyclical Redundancy Check (CRC Checksum errors)
- Errored Seconds (ES)
- Bursty Errored Seconds (BES)
- Severely Errored Seconds (SES)
- Unavailable Seconds (UAS)

**Important!** Digital parameters CRC, ES, BES, SES, and UAS are monitored at the Supervisory circuit pack, while Optical Parameters SPR-SU and SPT-SU are monitored at the OA circuit pack.



## OC-48/STM-16 OTU (OTU1) Performance Measurements

---

**Introduction** The OC-48/STM-16 OTU (OTU1) monitors and stabilizes the transmitted wavelength. To isolate faults on the incoming OC-48/STM-16 line, the OTU monitors the overhead B1 Parity Errors without altering the signal's contents.

**Monitored Analog SONET Parameters** The optical/analog parameters that are monitored, measured, and reported by the OC-48/STM-16 OTU (OTU1) are:

- Optical Power Received
- Laser Bias Current
- Optical Power Transmitted

**Monitored SDH Analog Parameters** The optical/analog parameters that are monitored, measured, and reported by the OC-48/STM-16 OTU (OTU1) are:

- Optical Power Received
- Optical Power Transmitted

**Monitored SONET Digital Parameters** The following digital parameters are monitored:

- B1 Coding Violation Counts
- Errored Seconds
- Severely Errored Seconds
- Severely Errored Frame Seconds

**Monitored SDH Digital Parameters** The following digital parameters are monitored:

- Background Block Errors
- Errored Seconds
- Severely Errored Seconds
- Unavailable Seconds





## OC-192/STM-64 with FEC OTU (OTU30) Performance Measurements

---

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction</b>                        | The OC-192/STM-64 OTU with FEC (OTU30) monitors the overhead B1 Parity Errors (without altering the signal's contents) in order to isolate faults on the incoming OC-192/STM-64 line.                                                                                                                                                                                                                                                                                       |
| <b>Monitored Optical/Analog Parameters</b> | <p>The optical/analog parameters that are monitored, measured, and reported by the OC-192/STM-64 OTU with FEC (OTU30) are:</p> <ul style="list-style-type: none"><li>• Optical Power Received</li><li>• Laser Bias Current</li><li>• Optical Power Transmitted</li></ul>                                                                                                                                                                                                    |
| <b>Monitored SDH Analog Parameters</b>     | <p>The optical/analog parameters that are monitored, measured, and reported by the OC-192/STM-64 OTU with FEC (OTU30) are:</p> <ul style="list-style-type: none"><li>• Optical Power Received</li><li>• Optical Power Transmitted</li></ul>                                                                                                                                                                                                                                 |
| <b>Monitored SONET Digital Parameters</b>  | <p>The following digital parameters are monitored:</p> <ul style="list-style-type: none"><li>• B1 Coding Violation Counts</li><li>• Errored Seconds</li><li>• Severely Errored Seconds</li><li>• Severely Errored Frame Seconds</li></ul> <p>The SONET/SDH performance parameters are unavailable during OCH Path FDI or OCH Client FDI since the SONET/SDH payload may be improperly formatted during these conditions (due to defects in the upstream FEC10G device).</p> |
| <b>Monitored SDH Digital Parameters</b>    | <p>The following digital parameters are monitored:</p> <ul style="list-style-type: none"><li>• Background Block Errors</li><li>• Errored Seconds</li><li>• Severely Errored Seconds</li><li>• Unavailable Seconds</li></ul> <p>The SONET/SDH performance parameters are unavailable during OCH Path FDI or OCH Client FDI since the SONET/SDH payload</p>                                                                                                                   |

may be improperly formatted during these conditions (due to defects in the upstream FEC10G device).

**Monitored FEC Parameters**

For an incoming OCh10G signal, the following parameters are monitored:

- FEC Error Count
- FEC Uncorrectable Block Count

The FEC performance parameters are unavailable during incoming OCH Path FDI since the incoming OCh-TC-AIS signal may contain frame slips. (Note that these frame slips are the result of the defect in the upstream FEC10G device.)



## HSBB OTU (OTU40) Performance Measurements

---

**Monitored Analog  
Parameters**

The optical/analog parameters that are monitored, measured, and reported by the High-Speed Broadband (HSBB) OTU (OTU40) are:

- Optical Power Received
- Laser Bias Current
- Optical Power Transmitted



## 4:1 10G Multiplex OTU (OTU70) Performance Measurements

---

**Introduction** The 4:1 10G Multiplex OTU (OTU70) supports LOS/LOF monitoring detection/reporting. At the source-side, the OTU70 will detect LOS and client (STS-48) LOF for each OC-48/STM-16 input. When a LOS or LOF is detected on one of more of the OC-48/STM-16 inputs, then the OTU70 inserts a keep-alive signal for the failed or absent channels. LOS or LOF conditions on any of the OC-48/STM-16 inputs to the OTU will not cause a loss of the remaining good channels. As with other OTU circuit packs, the OC-48/STM-16 outgoing optical signals are shut off in the event of a OTU circuit pack failure.

User-provisioned J0 Section Trace 16-byte format (for tracing, reading, and comparing) and 64-byte format (reading only) is supported. This capability is applicable for each of the four input ports in the source direction and each of the four output ports in the sink direction on a per-port basis. For the 16-byte format only, the J0 Section Trace string (STI) is provisionable, and comparison is made between the received and the expected J0 Section Trace string.

Other recently added features include:

- Support for user-provisioned OCh WaveWrapper Path Trace Identifier (OJ3) mismatch detection in the sink direction of the 10G MUX
- A health check for LambdaRouter Interworking
- Support for tone-trace on the 4:1 10G MUX that allows a user to operate and release tone trace on the line side output port of the 10G MUX

The 4:1 10G Multiplex OTU does not transmit an OC192 J0 16-byte string.

### **Monitored SONET Analog Parameters**

The optical/analog parameters that are monitored, measured, and reported by the 4:1 10G Multiplex OTU (OTU70) are:

- Optical Power Received
- Laser Bias Current
- Optical Power Transmitted

**Monitored SDH Analog Parameters**

The optical/analog parameters that are monitored, measured, and reported by the 4:1 10G Multiplex OTU (OTU70) are:

- Optical Power Received
- Optical Power Transmitted

**Monitored SONET Digital Parameters**

The following digital parameters are monitored:

- B1 Coding Violation Counts
- Errored Seconds
- Severely Errored Seconds
- Severely Errored Frame Seconds

The SONET/SDH performance parameters are unavailable during OCH Path FDI or OCH Client FDI since the SONET/SDH payload may be improperly formatted during these conditions (due to defects in the upstream FEC10G device).

**Monitored SDH Digital Parameters**

The following digital parameters are monitored:

- Background Block Errors
- Errored Seconds
- Severely Errored Seconds
- Unavailable Seconds

The SONET/SDH performance parameters are unavailable during OCH Path FDI or OCH Client FDI since the SONET/SDH payload may be improperly formatted during these conditions (due to defects in the upstream FEC10G device).

**Monitored FEC Parameters**

For an incoming OCh10G signal, the following parameters are monitored:

- FEC Error Count
- FEC Uncorrectable Block Count

The FEC performance parameters are unavailable during incoming OCH Path FDI since the incoming OCh-TC-AIS signal may contain frame slips. (Note that these frame slips are the result of the defect in the upstream FEC10G device.)

□

## OMON Circuit Pack Performance Measurements

---

**Introduction** Per Channel performance is monitored at least once every 15 minutes in order to detect degraded performance of the system. The OMON Circuit Pack's internal Optical Spectrum Analyzer (OSA) determines channel presence and signal power for each channel.

**Monitored Parameters** Per-channel performance parameters that are monitored, measured, and reported by the OMON circuit pack are:

- Signal Power Transmitted (SPT-C)
- Signal Power Received (SPR-C)



# Performance Data Processing

## Overview

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**Purpose** This section provides information on obtaining and setting operational values to use as a point of reference for optical parameter measurements.



## Baselining Optics

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**Overview** Baselining is defined as measuring the current power level of a performance parameter and saving it as the expected nominal operational value for that parameter. The purpose of a baseline value is to provide a basis from which to measure deviations from the nominal. Baseline values are established automatically or manually

Baselining optical power levels is done automatically through a User Command (Manual Baselining or Re-Baselining), and applies to provisionable parameters.





## Automatic Baselineing

---

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>                       | Automatic Baselineing establishes a reference power level for optical analog parameters at the time of baselineing. If necessary, these parameters can be re-baselined using TL1 commands                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>When Automatic Baselineing Occurs</b> | <p>The WaveStar® OLS 1.6T performs automatic baseline in the following situations:</p> <ul style="list-style-type: none"> <li>• Initial system installation</li> <li>• The addition of a single, bidirectional optical channel to an optical line</li> <li>• The deletion of a single, bidirectional optical channel from an optical line</li> </ul> <p><b>Important!</b> Automatic baselineing is not required after replacing an OA, ODU, OMU, OTU, or Supervisory circuit pack.</p>                                                                                                                                           |
| <b>Initial System Installation</b>       | <p>Following an initial system installation, automatic baselineing is performed on the following parameters:</p> <ul style="list-style-type: none"> <li>• TOPR-OL</li> <li>• TOPT-OL</li> <li>• SPR-SU</li> <li>• SPT-SU</li> </ul> <p><b>Important!</b> The WaveStar® OLS 1.6T does not automatically rebaseline a parameter upon system initialization once it has been baselined.</p>                                                                                                                                                                                                                                         |
| <b>Add A Single Optical Channel</b>      | <p>Automatic baselineing will be performed after a new optical channel has been added.</p> <p>The following parameters are automatically baselined:</p> <ul style="list-style-type: none"> <li>• TOPR-OL for the optical amplifier</li> <li>• TOPT-OL for the optical amplifier</li> <li>• If there are eight (8) or more channels present in the line after the addition of the new channel, the following parameters are automatically baselined: <ul style="list-style-type: none"> <li>- SPT-C for the <b>newly</b> added optical channel</li> <li>- SPR-C for the <b>newly</b> added optical channel</li> </ul> </li> </ul> |

- If there are fewer than eight (8) channels present in the line after the addition of the new channel, the following parameters are automatically baselineing:
  - SPT-C for **all** optical channels except those with active LOS or AIM conditions
  - SPR-C for **all** optical channels except those with active LOS or AIM conditions

**Important!** Any channel with an active LOS or AIM condition is not automatically baselineing.

#### Delete a Single Optical Channel

Automatic baselineing will be performed when an optical channel has been deleted.

The following parameters are automatically baselineing:

- TOPR-OL for the optical amplifier
  - TOPT-OL for the optical amplifier
- If there are eight or fewer channels present in the optical line before the deletion of the channel, the following parameters are automatically baselineing:
- SPT-C for **all** optical channels except those with active LOS or AIM conditions, and
  - SPR-C for **all** optical channels except those with LOS or AIM conditions



## Manual Baselineing

---

### Baselineing Commands

Manual Baselineing is performed at the user's discretion through the CIT graphical user interface, or through "Cut Through" mode with TL1 commands. The TL1 baselineing commands for manual baselineing are:

- SET-BASELINE-OLINE
- SET-BASELINE-SUPR
- RTRV-BASELINE-OLINE
- RTRV-BASELINE-SUPR
- SET-BASELINE-OCHAN
- RTRV-BASELINE-OCHAN

**Important!** Baselineing needs to be done at all NEs that this line, OChan, or SUPVY pass through.

Refer to Table 5-1 for a list of conditions under which manual baselineing can be performed.

**Table 5-1 User Commands for Manual Baselineing**

| Performance Parameter(s)                | TOPR-OL<br>OTPT-OL                                | SPR-SU<br>SPT-SU                                | SPR-C<br>SPT-C                                    |
|-----------------------------------------|---------------------------------------------------|-------------------------------------------------|---------------------------------------------------|
| <b>CIT PC User Commands</b>             | <b>SET-BASELINE-OLINE<br/>RTRV-BASELINE-OLINE</b> | <b>SET-BASELINE-SUPR<br/>RTRV-BASELINE-SUPR</b> | <b>SET-BASELINE-OCHAN<br/>RTRV-BASELINE-OCHAN</b> |
| A new system is installed               | Yes                                               | Yes                                             | Yes                                               |
| A previously installed OA is replaced   | Yes                                               | Yes                                             | Yes                                               |
| A SUPVY circuit pack is replaced        | —                                                 | Yes                                             | —                                                 |
| An OMON circuit pack is added/installed | —                                                 | —                                               | Yes                                               |
| A new channel is provisioned            | Yes                                               | —                                               | Yes                                               |
| An existing channel is removed          | Yes                                               | —                                               | —                                                 |

**Table 5-1 User Commands for Manual Baselineing (continued)**

| Performance Parameter(s)          | TOPR-OL<br>OTPT-OL                                | SPR-SU<br>SPT-SU                            | SPR-C<br>SPT-C                                    |
|-----------------------------------|---------------------------------------------------|---------------------------------------------|---------------------------------------------------|
| CIT PC User Commands              | SET-BASELINE-<br>OLINE<br>RTRV-BASELINE-<br>OLINE | SET-BASELINE-SUPR<br>RTRV-BASELINE-<br>SUPR | SET-BASELINE-<br>OCHAN<br>RTRV-BASELINE-<br>OCHAN |
| User specified Reason Codes (0-9) | Yes                                               | Yes                                         | Yes                                               |

**Notes:**

1. “—” in a table cell represents “Not Applicable.”

**Important!** Baselineing is independent of external equipment, such as when an Optical Spectrum Analyzer (OSA) is added or installed.



# Performance Parameters

## Overview

---

**Purpose** This sections provides information on the various performance parameters that the system supports. Knowledge of these parameters can be of assistance during trouble clearing procedures.



## Supported Parameters

---

### List of Parameters

is a list of all performance parameters supported by the WaveStar® OLS 1.6T.

**Table 5-2 Supported Performance Parameters**

| Monitor for         | Monitor at         | Direction | Type    | PM Parameter | Full Parameter Name                        | Type |
|---------------------|--------------------|-----------|---------|--------------|--------------------------------------------|------|
| Optical Line        | OA                 | Receive   | Analog  | TOPR-OL      | Total Optical Power Received               | 1    |
|                     |                    | Transmit  | Analog  | TOPT-OL      | Total Optical Power Transmitted            | 1    |
|                     |                    | Receive   | Analog  | PLE-RP1-6    | Pump Laser Efficiency per Receive OA Pump  | 2    |
|                     |                    | Transmit  | Analog  | PLE-TP1-6    | Pump Laser Efficiency per Transmit OA Pump | 2    |
| Supervisory Channel | OA                 | Receive   | Analog  | SPR-SU       | Signal Power Received (C-Band only)        | 1    |
|                     |                    | Transmit  | Analog  | SPT-SU       | Signal Power Transmitted                   | 1    |
|                     | SUPVY Circuit Pack | Receive   | Digital | CRC          | Cyclical Redundancy Check                  | 2    |
|                     |                    | Receive   | Digital | ES           | Errored Seconds                            | 2    |
|                     |                    | Receive   | Digital | BES          | Bursty Errored Seconds                     | 2    |
|                     |                    | Receive   | Digital | SES          | Severely Errored Seconds                   | 2    |
|                     |                    | Receive   | Digital | UAS          | Unavailable Errored Seconds                | 2    |

**Table 5-2 Supported Performance Parameters (continued)**

| Monitor for              | Monitor at               | Direction | Type    | PM Parameter             | Full Parameter Name                                      | Type |
|--------------------------|--------------------------|-----------|---------|--------------------------|----------------------------------------------------------|------|
| OTU OC-48/<br>STM-16     | OC-48/<br>STM-16<br>OTU  | Receive   | Analog  | OPR                      | Optical Power Received                                   | 3    |
|                          |                          | Transmit  | Analog  | LBC                      | Laser Bias Current                                       | 2    |
|                          |                          | Transmit  | Analog  | OPT                      | Optical Power Transmitted                                | 3    |
|                          |                          | Receive   | Digital | CVS/BBE                  | B1 Coding Violations Count/<br>Background Block Errors   | 2    |
|                          |                          | Receive   | Digital | ESS/ESS                  | RS Errored Seconds/<br>Errored Seconds                   | 2    |
|                          |                          | Receive   | Digital | SESS/SESS                | RS Severely Errored Seconds/<br>Severely Errored Seconds | 2    |
|                          |                          | Receive   | Digital | SEFSS/ <a href="#">1</a> | RS Errored Frame Seconds                                 | 2    |
|                          |                          | Receive   | Digital | <a href="#">2</a> /UAS   | Unavailable Seconds                                      | 2    |
| OTU HSBB                 | HSBB OTU                 | Receive   | Analog  | OPR                      | Optical Power Received                                   | 3    |
|                          |                          | Transmit  | Analog  | LBC                      | Laser Bias Current                                       | 2    |
|                          |                          | Transmit  | Analog  | OPT                      | Optical Power Transmitted                                | 3    |
| OTU<br>OC-192/<br>STM-64 | OC-192/<br>STM-64<br>OTU | Receive   | Analog  | OPR                      | Optical Power Received                                   | 3    |
|                          |                          | Transmit  | Analog  | LBC                      | Laser Bias Current                                       | 2    |
|                          |                          | Transmit  | Analog  | OPT                      | Optical Power Transmitted                                | 3    |
|                          |                          | Receive   | Digital | CVS/BBE                  | B1 Coding Violations Count                               | 2    |
|                          |                          | Receive   | Digital | ESS/ESS                  | RS Errored Seconds                                       | 2    |
|                          |                          | Receive   | Digital | SESS/SESS                | RS Severely Errored Seconds                              | 2    |
|                          |                          | Receive   | Digital | SEFSS/ <a href="#">1</a> | RS Errored Frame Seconds                                 | 2    |
|                          |                          | Receive   | Digital | <a href="#">2</a> /UAS   | Unavailable Seconds                                      | 2    |
|                          |                          | Receive   | Digital | FEC-EC                   | FEC Error Count                                          | 2    |
|                          |                          | Receive   | Digital | FEC-UBC                  | FEC Uncorrectable Block<br>Count                         | 2    |



**Table 5-2 Supported Performance Parameters (continued)**

| Monitor for        | Monitor at         | Direction | Type    | PM Parameter    | Full Parameter Name                                          | Type |
|--------------------|--------------------|-----------|---------|-----------------|--------------------------------------------------------------|------|
| 4:1 10G<br>MUX OTU | 4:1 10G<br>MUX OTU | Receive   | digital | CVS/BBE         | B1 Coding Violation Counts<br>(OC-48/STM-16 inputs only)     | 2    |
|                    |                    | Receive   | digital | ESS/ESS         | RS Errored Seconds<br>(OC-48/STM-16 inputs only)             | 2    |
|                    |                    | Receive   | digital | SESS/SESS       | RS Severely Errored Seconds<br>(OC-48/STM-16)                | 2    |
|                    |                    | Receive   | digital | SEFSS/ <u>1</u> | RS Errored Framed Seconds<br>(OC-48/STM-16 inputs only)      | 2    |
|                    |                    | Receive   | digital | <u>2</u> /UAS   | Unavailable Seconds                                          | 2    |
|                    |                    | Receive   | digital | FEC-EC          | FEC Error Count (MUX OCh<br>10G input only)                  | 2    |
|                    |                    | Receive   | digital | FEC-UBC         | FEC Uncorrectable Block<br>Count (MUX OCh 10G input<br>only) | 2    |
|                    |                    | Transmit  | digital | CVS             | B1 Coding Violation Counts<br>(OC-48/STM-16 outputs only)    | 2    |
|                    |                    | Transmit  | digital | ESS             | RS Errored Seconds<br>(OC-48/STM-16 outputs only)            | 2    |
|                    |                    | Transmit  | digital | SESS            | RS Severely Errored Seconds<br>(OC-48/STM-16 outputs only)   | 2    |
|                    |                    | Transmit  | digital | SEFSS           | RS Error Framed Seconds<br>(OC-48/STM-16 outputs only)       | 2    |
|                    |                    | Receive   | analog  | OPR             | MUX OCh 10G Optical Power<br>Received                        | 3    |
|                    |                    | Transmit  | analog  | LBC             | MUX OCh 10G Laser Bias<br>Current                            | 2    |
|                    |                    | Transmit  | analog  | OPT             | MUX OCh 10GOptical Power<br>Transmitted                      | 3    |

Table 5-2 Supported Performance Parameters (continued)

| Monitor for     | Monitor at | Direction | Type   | PM Parameter | Full Parameter Name                  | Type |
|-----------------|------------|-----------|--------|--------------|--------------------------------------|------|
| Optical Channel | OMON       | Transmit  | Analog | SPT-C        | Per Channel Signal Power Transmitted | 1    |
|                 |            | Receive   | Analog | SPR-C        | Per Channel Signal Power Received    | 1    |

Notes:

- 1. SEFSS has no SDH equivalent.
- 2. UAS has no SONET equivalent.



# Parameter Processing

**Parameter Definitions** Refer to [Table 5-3, “Performance Parameter Processing” \(5-28\)](#) for a description of the processing performed for each of the two (2) types of parameters.

**Table 5-3 Performance Parameter Processing**

| Parameter Type | PM Report                                | Threshold Provisioning | Threshold Retrieval | TCA/QOS Notification | Baselining |
|----------------|------------------------------------------|------------------------|---------------------|----------------------|------------|
| 1              | Yes                                      | Yes<br>(Set by User)   | Yes                 | Yes                  | Yes        |
| 2              | Yes                                      | Yes<br>(Set by User)   | Yes                 | Yes                  | No         |
| 3              | Yes<br><br>IN RANGE<br><br>OUT OF RANGE) | No<br>(Set by Factory) | No                  | Yes                  | No         |

**Circuit Pack Removal** Once a circuit pack has been removed, digital performance data that has been stored and that is associated with the removed circuit pack is discarded by the system.



## Optical Line Signal Power Parameters

---

### **Total Optical Power Received (TOPR-OL)**

The sum of per-channel signal power received for the specified optical line. The TOPR-OL has a baseline value that can be set externally by a user command. The TOPR-OL is a function of the total number of channels at any given time. Whenever a channel is added or removed, this parameter can be manually re-baselined. Upon execution of the baselining command, the TOPR-OL baseline value is displayed in the PM report, next to the currently measured value, in dBm.

**Important!** Baselining is done automatically when a channel is added or removed. Re-baselining can be initiated manually by an external user command.



### **CAUTION**

*When TOPR-OL is re-baselined, any optical line that is in a defect state (LOS or AIM) is not re-baselined. If LOS occurs in one or more channels, baselining the TOPR-OL may result in an incorrect baseline value. Do not re-baseline if a LOS condition occurs for a channel.*

### **Total Optical Power Transmitted (TOPT-OL)**

The sum of per-channel signal power transmitted for the specified optical line. The TOPT-OL has a baseline value that can be set externally by a user command. This baseline value is helpful in determining degraded service performance. The TOPT-OL is a function of the total number of channels at any given time. Whenever a channel is added or removed, this parameter can be manually re-baselined. Upon execution of the baselining command, the TOPT-OL baseline value is displayed in the PM report, next to the currently measured value, in dBm.

**Important!** Baselineing is done automatically when a channel is added or removed. Re-baselineing can be initiated manually by an external user command.



## CAUTION

*When TOPT-OL is re-baselined, any optical line that is in a defect state (LOS or AIM) is not re-baselined. If LOS occurs in one or more channels, baselineing the TOPT-OL may result in an incorrect baseline value. Do not re-baseline if a LOS condition occurs for a channel.*



## Optical Line Equipment Health Parameters

---

**Pump Laser Efficiency**  
**PLE-RP1-6, PLE-TP1-6**

The Pump Laser Efficiency (PLE) provides an indication of the level of performance of the pump lasers of the OA. The major contribution to PLE is aging, which causes permanent degradation of performance under the same system condition.

Other factors affecting the performance of pump lasers are:

- number of channels
- input power



## Supervisory Channel Performance Parameters

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### Signal Power Received (SPR-SU)

The signal power received for the Supervisory Channel. The SPR-SU has a baseline value that can be set externally by a user command. This baseline value is helpful in determining degraded service performance. The SPR-SU baseline value is displayed in the PM report, next to the currently measured value, in dBm.

**Important!** Baselineing is done automatically during initial system installation. Re-baselineing can be initiated manually by an external user command.



### CAUTION

*When SPR-SU is re-baselined, any optical line that is in a defect state (LOS or AIM) is not re-baselined. If LOS occurs in the channel, baselineing the SPR-SU may result in an incorrect baseline value. Do not re-baseline if a LOS condition occurs for the channel.*

### Signal Power Transmitted (SPT-SU)

The signal power transmitted for the Supervisory Channel. The SPT-SU has a baseline value that can be set externally by a user command. This baseline value is helpful in determining degraded service performance. The SPT-SU baseline value is displayed in the PM report, next to the currently measured value, in dBm.

**Important!** Baselineing is done automatically during initial system installation. Re-baselineing can be initiated manually by an external user command.



### CAUTION

*When SPT-SU is re-baselined, any optical line that is in a defect state (LOS or AIM) is not re-baselined. If LOS occurs in the channel, baselineing the SPT-SU may result in an incorrect baseline value. Do not re-baseline if a LOS condition occurs for the channel.*





## Supervisory Digital Parameters

**Overview** The Supervisory circuit pack monitors a series of parity errors for the health of the Supervisory Channel. The SUPVY signal operates at a data rate of 2.048 Mbps and is formatted according to the standards for an E1 signal format, with respect to framing, CRC error monitoring, and channel numbering. The first time slot (Channel 0) is used for framing (FRM) and parity error checking (CRC Checksum Errors.)

**Monitored Parity Errors** Refer to [Table 5-4, “Error Event Counter Definitions” \(5-33\)](#) for complete definition information about each of the monitored parity errors.

**Table 5-4 Error Event Counter Definitions**

| Error Event                    | Error Event Definition                                                           | Counter Size (bits) |
|--------------------------------|----------------------------------------------------------------------------------|---------------------|
| CRC (Cyclical Checksum Errors) | Any received Checksum in error.                                                  | 16                  |
| Errored Second Events          | Any incorrect received CRC Checksum within a one second interval.                | 16                  |
| Bursty Errored Second Events   | Greater than 1, but less than 915, CRC checksum errors within a 1 second period. | 16                  |
| Severely Errored Second Events | 915 or more CRC Checksum errors within a one second period.                      | 16                  |
| Unavailable Second Events      | A one second period in the unavailable state.                                    | 16                  |



## OTU Performance Parameters

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### **Optical Power Received (OPR)**

Each receiver interface in the terminals and regenerators monitors the amount of power received from the fiber. OPR is reported as either IN-RANGE or OUT-OF-RANGE. There is no high threshold for OPR, while the low OPR threshold is calibrated in the factory and is not user-provisionable.

When the low OPR threshold is crossed, a TCA/QOS is sent.

### **Optical Power Transmitted (OPT)**

Each transmitter interface in the terminals and regenerators monitors the amount of power generated by the laser. OPT is reported as either IN-RANGE or OUT-OF-RANGE. The high and low threshold values are calibrated in the factory and are not user-provisionable.

When either OPT threshold is crossed, a TCA/QOS is sent.

### **OPR and OPT Threshold Values**

The OPR and OPT parameters associated with the OTU circuit pack and are based on normalized values shown in the form of X.XX.

OPR has a threshold value of 1.0 that is not user-provisionable. If the current measured value is more or equal 1.00, the receive signal power of the OTU port is operating normally (IN range). However, if the current measured OPR value is less than 1.00, a status of Out Of Range (OOR) will be displayed.

OPT has a low threshold value of 0.80 and a high threshold value of 1.20 that are also not user-provisionable. If the current measured value is within the limits of 0.80 and 1.20 inclusive, the transmit signal power of the OTU port is operating normally (IN range), else a status of OOR will be displayed.

Unlike other analog parameters, for example, TOPR, status, to save SNMS code, the value of OPR/OPT is IN and OOR (not GT or LT).

Because the OPR and OPT values are based on a normalized value, it is not practical to display actual power in values of dBm.



## OTU Equipment Health Parameters

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**Laser Bias Current (LBC)** Each transmitter interface in the terminals and regenerators monitors the Laser Bias Current (LBC). The value of the LBC is normalized to the LBC factory value. There is no low threshold for LBC, while the high LBC threshold value is user-provisionable.

When the high LBC threshold is crossed, a TCA/QOS is sent.



## Section B1 Byte Digital Performance Parameters

**SONET Section Definition** In SONET terminology, the Regenerator Section (RS) is referred to as the ***Sonet Section***. The SONET Section parameters monitor the portion of a transmission facility including terminating points, between either a terminal NE and a regenerator or two regenerators. A terminating point is the point after signal regeneration at which performance monitoring may be done.

**Monitored SONET Parameters** Refer to [Table 5-5, “Monitored SONET Physical Layer Performance Parameters” \(5-36\)](#) for a list of SONET physical layer performance parameters that are monitored by the WaveStar® OLS 1.6T system.

**Table 5-5 Monitored SONET Physical Layer Performance Parameters**

| Acronym | Full Name                            | Definition                                                            |
|---------|--------------------------------------|-----------------------------------------------------------------------|
| CVS     | Coding Violations Count              | Count of BIP-8 errors (B1 Byte)                                       |
| ESS     | Errored Seconds Count                | BIP-8 errors (B1) $\geq$ or SEF $\geq$ 1 or LOS $\geq$ 1              |
| SESS    | Severely Errored Seconds Count       | BIP-8 errors (B1) $\geq$ 2392 or 8554 or SEF $\geq$ 1 or LOS $\geq$ 1 |
| SEFSS   | Severely Errored Frame Seconds Count | SEF $\geq$ 1                                                          |

**SDH Section Definition** In SDH terminology, the Regenerator Section (RS) is referred to as the ***SDH Section***. The SDH Section parameters monitor the portion of a transmission facility including terminating points, between either a terminal NE and a regenerator or two regenerators. A terminating point is the point after signal regeneration at which performance monitoring may be done.

**Monitored SDH Parameters** Refer to [Table 5-6, “Monitored SDH Physical Layer Performance Parameters” \(5-36\)](#) for a list of SDH physical layer performance parameters that are monitored by the WaveStar® OLS 1.6T system.

**Table 5-6 Monitored SDH Physical Layer Performance Parameters**

| Acronym | Full Name               | Definition                                                              |
|---------|-------------------------|-------------------------------------------------------------------------|
| BBE     | Background Block Errors | BBE = EBS If SESS = 0 If SESS declared then SESS =1 and BBE set to zero |

**Table 5-6 Monitored SDH Physical Layer Performance Parameters (continued)**

| Acronym | Full Name                | Definition                                                                                                                                                        |
|---------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ESS     | Errored Second           | EB $\geq$ 1 LOF $\geq$ 1 or LOS $\geq$ 1                                                                                                                          |
| SESS    | Severely Errored Seconds | SESS declared if EBS $\geq$ 2400 blks/sec (30% x 8000 total blks/sec) If SESS declared then SESS = 1 and BBE set to zero and ESS = 1 LOF $\geq$ 1 or LOS $\geq$ 1 |
| UAS     | Unavailable Seconds      | 0 consecutive SESS then Unavailable Time (UAT) declared If 10 consecutive SESS counted then SESS set to zero and UASS set to 10                                   |



## Optical Channel Signal Power Parameters

---

### Signal Power Transmitted Per Channel (SPT-C)

This is the signal power transmitted for the specified optical channel. The SPT-C has a baseline value that can be set externally by a user command. This baseline value is used to determine high and low threshold crossings for detecting degraded service performance. Whenever a channel is added or removed, this parameter can be manually re-baselined. Upon execution of the baselining command, the PM report next to the currently measured value, in dBm.

Baselining is done automatically when a channel is added. RE-baselining can be initiated manually by an external user command.



### CAUTION

*When SPT-C is re-baselined, any optical line that is in a defect state (LOS or AIM) is not re-baselined. If LOS occurs in the channel, baselining the SPT-C may result in an incorrect baseline value. Do not re-baseline if an LOS condition occurs for the channel.*

### Signal Power Received Per Channel (SPR-C)

This is the signal power received for the specified optical channel. The SPR-C has a baseline value that can be set externally by a user command. This baseline value is used to determine high and low threshold crossings for detecting degraded service performance. Whenever a channel is added or removed, this parameter can be manually re-baselined. Upon execution of the baselining command, the SPT-C baseline value is displayed in the SPR-C baseline value is displayed in the PM report next to the currently measured value, in dBm.

Baselining is done automatically when a channel is added.  
Re-baselining can be initiated manually by an external user command.



## CAUTION

*When SPR-C is re-baselined, any optical line that is in a defect state (LOS or AIM) is not re-baselined. If LOS occurs in the channel, baselining the SPR-C may result in an incorrect baseline value. Do not re-baseline if an LOS condition occurs for the channel.*

### Report Inhibiting

Autonomous reporting of the SPR-C and SPT-C Threshold Crossing Alerts (TCA)/Quality of Signal (QOS) is inhibited during period in which any of the following conditions is true:

- The OLS 1.6T Line is in one of the following defect states:
  - Total Optical Channel LOS
- The respective OLS 1.6T channel is in one of the following defect states:
  - Channel LOS
  - Channel AIM
- There is no association at the head end (or WAD) for this channel.



# Thresholds

## Overview

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**Purpose** This section provides information on analog and digital performance parameter thresholds, provides background information on each type, and categorizes those which can and cannot be user-provisioned.





## Performance Parameter Thresholds

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- Overview** Performance parameter thresholds are set to show degraded performance. Two types of thresholds are:
- Counter-Threshold, which is associated with digital parameters and can be user-provisioned.
  - Gauge-threshold, which is associated with analog parameters, and may be user-provisioned.

Each provisionable Performance Monitoring parameter includes two threshold registers:

- 15 minutes
- 24 hours

- Gauge-Thresholds** WaveStar® OLS 1.6T system uses gauge-thresholds for all analog parameters. Unlike counter parameters, which can only increase in value until reset, the value of a gauge parameter can increase or decrease over time.
- The Optical Power Transmitted (OPT), Optical Power Received (OPR), and Laser Bias Currents for the OTUs, have threshold values calibrated at the factory and can not be user-provisioned.
- Analog parameters have two associated user-provisioned thresholds:
- High threshold parameter, and
  - Low threshold parameter
- Each gauge threshold has a gauge value:
- **High Threshold**  
Defines the value that the gauge must reach or exceed in order to optionally generate a QOS notification. This value, when combined with the notification switch state, controls the generation of the QOS notification.  
Initially, if the switch is on and the gauge value becomes equal to or greater than the high threshold's gauge value (in a positive going direction,) then the defined event notification is triggered. Subsequent crossings of the high threshold's gauge value does not generate additional event reports unless the gauge value becomes equal to or less than the low threshold's value.
  - **Low Threshold**

Defines the value that the gauge must fall below in order to optionally generate a QOS notification. This value, when combined with the notification switch state, controls the generation of the QOS notification.

Initially, if the switch is on and the gauge value becomes equal to or less than the low threshold's gauge value (in a negative going direction), then the defined event notification is triggered.

Subsequent crossings of the low threshold's gauge value does not generate additional event reports unless the gauge value becomes equal to or greater than the high threshold's gauge value.

### Counter Thresholds

Counter thresholds are accumulative in nature and are used for reporting digital Performance Measurement parameters, such as Coding Violations (CVs.) A counter threshold has only one threshold value.

#### **For one-day counter - UAS, ES, SESS, SEFS and BES (SUPVY only)**

If a value up to 86400 and status of GT are displayed, it means that during a one-day period the value exceeded the provisioned threshold. However, if a value of 86400 and status of OVFL for the PM parameter are displayed, it means that the value not only exceeded the provisioned threshold during a one-day period, it also exceeded the limit of 86400 (the maximum number of seconds in a day). This can occur if there is a difference in the WS-clock and board-controller clock. As a result, the OVFL flag can be assumed to be the same as the GT flag.

#### **For 15-min counter - UAS, ES and SESS, SEFS and BES (SUPVY only)**

If a value up to 900 and status of GT are displayed, it means that during a 15-min period the value exceeded the provisioned threshold. However, if a value of 900 and status of OVFL for the PM parameter are displayed, it means that the value not only exceeded the provisioned threshold during a 15-min period, it also exceeded the limit of 900 (the maximum number of seconds in a 15-min period). This can occur if there is a difference in the WS-clock and board controller clock. As a result, the OVFL flag can be assumed to be the same as the GT flag.



## Parameter Threshold Provisioning

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**Provisionable Thresholds**    The following types of parameter thresholds can be user-provisioned:

- All digital parameters
  - CRC
  - BBE
  - ES
  - BES
  - SES
  - UAS
  - CVS
  - ESS
  - SESS
  - SEFSS
  - FEC-EC
  - FEC-UBC
- Optical Signal Power Parameters
  - TOPR-OL
  - TOPT-OL
  - SPR-SU
  - SPT-SU
  - SPT-C
  - SPR-C
- Optical Line Equipment Health Parameters
  - PLE-RP1–6
  - PLE-TP1–6
- OTU Equipment Health Parameters
  - LBC

**Digital Parameters**    Refer to [Table 5-7, “Summary of Digital Performance Monitoring Processes that Affect Digital Parameters” \(5-44\)](#) for a summary of the Performance Monitoring Processing/Functions that affect digital performance parameters.

**Table 5-7 Summary of Digital Performance Monitoring Processes that Affect Digital Parameters**

| Monitored For:                      | PM Parameter<br>SONET/SDH | Initialize<br>Registers | User<br>SET/RTRV<br>Thresholds | QOS<br>Alarm/Clear | QOS Alarm<br>Report | PM<br>Report | RTRV-<br>PM/TH-<br>"ALL" |
|-------------------------------------|---------------------------|-------------------------|--------------------------------|--------------------|---------------------|--------------|--------------------------|
| Supervisory<br>Channel              | CRC                       | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | ES                        | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | BES                       | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | SES                       | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | UAS                       | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
| OTU<br>OC-48/STM-16                 | CVS/BBE                   | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | ESS/ESS                   | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | SESS/SESS                 | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | SEFSS/ <u>1</u>           | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | <u>2</u> /UAS             | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
| OTU<br>OC-192/STM-64                | CVS/BBE                   | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | ESS/ESS                   | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | SESS/SESS                 | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | SEFSS/ <u>1</u>           | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | <u>2</u> /UAS             | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | FEC-EC                    | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | FEC-UBC                   | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
| 4:1 10G<br>Multiplex OTU<br>(OTU70) | CVS/BBE                   | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | ESS/ESS                   | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | SESS/SESS                 | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | SEFSS/ <u>1</u>           | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | FEC-EC                    | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |
|                                     | FEC-UBC                   | Yes                     | Yes                            | Yes                | Yes                 | Yes          | Yes                      |

**Notes:**

1. SEFSS is not supported in SDH.
2. UAS is not supported in SONET.

**Analog Parameters**

Refer to [Table 5-8, "Summary of Analog Performance Monitoring Processes that Affect Analog Parameters" \(5-45\)](#) for a summary of the Performance Monitoring Processing/Functions that affect analog

performance parameters.

**Table 5-8 Summary of Analog Performance Monitoring Processes that Affect Analog Parameters**

| Monitored For:                | PM Parameter | Manual Baseline | SET/RTRV Thresholds | QOS Alarm/Clear | QOS Alarm Report | PM Report |
|-------------------------------|--------------|-----------------|---------------------|-----------------|------------------|-----------|
| Optical Line                  | TOPR-OL      | Yes             | Yes                 | Yes             | Yes              | Yes       |
|                               | TOPT-OL      | Yes             | Yes                 | Yes             | Yes              | Yes       |
|                               | PLE-RP1-6    | —               | Yes                 | Yes             | Yes              | Yes       |
|                               | PLE-TP1-6    | —               | Yes                 | Yes             | Yes              | Yes       |
| Supervisory Channel           | SPR-SU       | Yes             | Yes                 | Yes             | Yes              | Yes       |
|                               | SPT-SU       | Yes             | Yes                 | Yes             | Yes              | Yes       |
| OTU OC-48/STM-16              | OPR          | —               | —                   | Yes             | Yes              | Yes       |
|                               | LBC          | —               | Yes                 | Yes             | Yes              | Yes       |
|                               | OPT          | —               | —                   | Yes             | Yes              | Yes       |
| OTU HSB                       | OPR          | —               | —                   | Yes             | Yes              | Yes       |
|                               | LBC          | —               | Yes                 | Yes             | Yes              | Yes       |
|                               | OPT          | —               | —                   | Yes             | Yes              | Yes       |
| OTU OC-192/STM-64             | OPR          | —               | —                   | Yes             | Yes              | Yes       |
|                               | LBC          | —               | Yes                 | Yes             | Yes              | Yes       |
|                               | OPT          | —               | —                   | Yes             | Yes              | Yes       |
| 4:1 10G Multiplex OTU (OTU70) | OPR          | —               | —                   | Yes             | Yes              | Yes       |
|                               | LBC          | —               | Yes                 | Yes             | Yes              | Yes       |
|                               | OPT          | —               | —                   | Yes             | Yes              | Yes       |
| Optical Channel               | SPR-C        | Yes             | Yes                 | Yes             | Yes              | Yes       |
|                               | SPT-C        | Yes             | Yes                 | Yes             | Yes              | Yes       |

Thresholds are set and reported using relative dB values. By using relative values, new high and low thresholds are automatically adjusted after rebaselining.

Each provisioned analog parameter has four associated thresholds:

- notifyHigh (notifyHigh1), user provisionable
- clearHigh (notifyLow1), non-user provisionable
- notifyLow (notifyLow2), user provisionable
- clearLow (notifyHigh2), non-user provisionable

**Important!** Do not use 0 or 1 dB due to the frequency of the TCA for the following thresholds:

- Optical Signal Power Parameters (TOPR-OL, TOPT-OL, SPR-SU, SPT-SU, SPT-C, SPR-C)
- Optical Line Equipment Health Parameters (PLE-RP1-6, PLE-TP1-6)
- OTU Equipment Health Parameters (LBC)

**Repeater and WAD SPR-C  
and SPT-C Thresholds**

For the Repeater and WAD, since both the SPR-C and SPT-C refer to the same measurement point, their thresholds should be set to the same value. Only the SPT-C threshold shall be used for the generation of TCA. In other words, no TCA will be generated for the SPR-C.

**Repeater and WAD  
PLE-RPn and PLE-TPn  
Thresholds**

For the Repeater and WAD, since both the PLE-RPn and PLE-TPn (each "n" is one of six OA pumps) refer to the same measurement point, their thresholds should be set to the same value. Only the PLE-RPn threshold shall be used for the generation of TCA.



## QOS Alarm Events

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**Introduction** The Quality of Service (QOS) notification message is reported to the operations system and interfaces where threshold crossings associated with a particular path can be correlated and the most probable source of the degradation can be identified.

**Important!** To activate TCAs, you must turn on QOS for the required PM parameter(s) from the CIT GUI or PROV-TH TL1 command

**Reporting** The WaveStar® OLS 1.6T system reports threshold crossings as Quality of Service (QOS) alarm messages/event notifications on the individual parameters monitors. A QOS alarm message is triggered whenever a monitored performance parameter crosses the high or low threshold associated with the parameter.

**Message Characteristics** The QOS event/notification autonomous messages have the following characteristics:

- The messages are reported as autonomous alarm messages to the OS and user interface
- QOS does not raise any visual or audible alarms
- Alarm messages can be retrieved in the CIT TL/1 RTRV-ALM-ALL report
- A QOS entry is logged in the history report which may then be retrieved by the user

**QOS Alarm Levels** Refer to [Table 5-9, “Alarm Attributes Associated with QOS” \(5-47\)](#) for a list of alarm levels that are associated with QOS.

**Table 5-9 Alarm Attributes Associated with QOS**

|                        | Alarm Attributes Provisioning as: |              |
|------------------------|-----------------------------------|--------------|
|                        | CIT PC (SONET)                    | CIT PC (SDH) |
| QOS<br>Alarm Indicator | NA<br>(Not Alarmed)               | No Alarm     |



## Clearing QOS Alarms

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**clearHigh** The clearHigh alarm-clearing threshold defines the value that the gauge must reach in order to clear the QOS notification. This value, when combined with the switch state, controls the clearing of the notification. If notifyHigh's on/off switch is on and the gauge value becomes equal to or less than the clearHigh's gauge value (in the negative going direction) then the defined event notification is cleared.

**Important!** ClearHigh is non-provisionable and is fixed to be 10% lower than the value of notifyHigh.

**clearLow** The clearLow alarm-clearing threshold defines the value that the gauge must reach or exceed in order to clear the QOS notification. This value, when combined with the switch state, controls the clearing of the notification. If notifyLow's on/off switch is on, and the gauge value becomes equal to or higher than notifyLow's gauge value (in a positive going direction), then the defined event clearing is triggered.

**Important!** ClearLow is non-provisionable and is fixed to be 10% higher than the value of notifyLow.

□



## Thresholds that are not User-Provisioned

---

**Description** Some parameters that check laser aging or equipment failures are monitored internally. These parameters have a high threshold and a low threshold, neither of which can be user-provisioned. The threshold values are initially measured in the factory and are stored on the associated circuit pack. During normal operation, each parameter is measured and compared with the high and low thresholds associated with that parameter.

**Threshold Values** Refer to [Table 5-10, “High and/or Low Thresholds Parameters that Can NOT be User-provisioned” \(5-49\)](#) for values for non-provisionable parameters.

**Table 5-10 High and/or Low Thresholds Parameters that Can NOT be User-provisioned**

| Monitored For        | PM Parameter | Acceptable Threshold Range                                                                          |
|----------------------|--------------|-----------------------------------------------------------------------------------------------------|
| OTU<br>OC-48/STM-16  | OPR          | high threshold: none<br>low threshold: $\geq$ EEPROM value calibrated at factory                    |
|                      | OPT          | high threshold: 120% of factory initial value<br>low threshold: $\geq$ 80% of factory initial value |
| OTU<br>HSBB          | OPR          | high threshold: none<br>low threshold: $\geq$ EEPROM value calibrated at factory                    |
|                      | OPT          | high threshold: 120% of factory initial value<br>low threshold: $\geq$ 80% of factory initial value |
| OTU<br>OC-192/STM-64 | OPR          | high threshold: none<br>low threshold: $\geq$ EEPROM value calibrated at factory                    |
|                      | OPT          | high threshold: 120% of factory initial value low threshold: $\geq$ 80% of factory initial value    |







# 6 Maintenance

## Overview

---

**Purpose** This chapter introduces maintenance features of the WaveStar® OLS 1.6T. These features continuously monitor the overall health of all the equipment and the signals passing through the system.

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# Maintenance Signals

## Overview

---

**Purpose** The WaveStar® OLS 1.6T system uses maintenance signals and messages to identify and isolate faulty equipment within the system. WaveStar® OLS 1.6T is an optically amplified line system that has access to some SONET/SDH overhead data, as well as Optical Channel Overhead Data, within the optical line signal.

**Maintenance Signals** The following signals are used by the WaveStar® OLS 1.6T:

- Keep Alive Signal (includes AIS-L, Pseudo-AIS, OCH Client FDI, and OCH TC-AIS)
- Supervisory Signal (includes Optical Channel Alarm Indication Message). See the **WaveStar® OLS 1.6T Applications Planning Guide** (365-575-713R6.2) for more information about the Supervisory Signal.
- J0 Section Trace Identifier for SONET/SDH
- Optical Channel Trace for OCh10G



## Keep Alive Signal

---

**Description** A keep-alive signal is a signal that is transmitted by the Optical Translator Unit (OTU) in place of a normal signal in order to maintain transmission continuity. The keep-alive signal may also indicate to the receiving equipment that there has been a transmission interruption located either at the equipment originating the keep alive signal or upstream (opposite the direction of transmission) of that equipment.

There are four different keep-alive signals in the OLS 1.6T system. Two of the alarms use Alarm Indication Signals (AIS).

1. AIS-L (Line Alarm Indication Signal, SONET. Multiplex Section AIS, SDH equivalent).
2. Pseudo-AIS (Proprietary AIS signal).
3. OCh Client FDI (Optical Channel Client Forward Defect Indicator). This is used in OTUs with WaveWrapper
4. OCh TC-AIS (Optical Channel Tandem Connection Alarm Indication Signal). This is used in OTUs with WaveWrapper.

The OC-48/STM-16 OTU uses the AIS-L keep-alive signal. When an OC-48/STM-16 OTU port has a Terminal Drop association, and an AIS-L is detected at the OTU IN port, the software either allows the AIS-L signal to pass through the OTU, or it turns off the transmit LASER as determined by a provisionable parameter set by the user. This is provisioned on a per-port basis using the ENT-OTPS TL1 command. The original value of the provisioned parameter is to shut off the transmit LASER. When the transmit LASER is turned off because an AIS-L is detected, an OTU LASER shut off status condition is activated.



## Supervisory Signal

---

**Description** The Supervisory (SUPVY) Signal performs the following functions:

- transports messages between WaveStar® OLS 1.6T NEs
- allows connectivity testing during installation and operation
- carries pump power-up information across nodes
- enables voice communications through Orderwire

The SUPVY Channel is unamplified and can run with OA lasers off.

**Optical Channel Alarm  
Indication Message  
(OCAIM)**

An OCAIM notifies the downstream (in the direction of transmission) equipment when an incoming optical channel Loss of Signal defect is declared at an OA circuit pack. The downstream message has both the optical channel and the injected SUPVY signal. This message is sent downstream via the SUPVY DL to suppress or unsuppress the downstream alarms when an incoming optical channel LOS is declared or cleared at a WaveStar® OLS 1.6T NE.



# J0 Section Trace Identifier (STI)

**Purpose** The WaveStar® OLS 1.6T can read the J0 Section Trace Identifier (STI) for both OC-48/STM-16, OC-192/STM-64, and OC-192/STM-64 FEC signals. The J0 STI Byte allows the tracing, reading, and comparing of the received signal with the expected OC-48/STM-16, OC-192/STM-64, and/or OC-192/STM-64 FEC signal at the OTUs.

**Description of J0 STI** The J0 STI Byte is a 16-byte, fixed length string that is transmitted in 16 consecutive OC-48/STM-16 or OC-192/STM-64 frames. This string is transmitted in the J0 byte position of the section overhead of the first STS-1 of each of the OC-48/STM-16 or OC-192/STM-64 frames and is retrievable on demand.

Table 6-1 J0 STI 16-Byte Frame

| Frame/Byte # | Bit Value      |                |                |                |                |                |                |                |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|              | b <sub>0</sub> | b <sub>1</sub> | b <sub>2</sub> | b <sub>3</sub> | b <sub>4</sub> | b <sub>5</sub> | b <sub>6</sub> | b <sub>7</sub> |
| 1            | 1              | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | C <sub>4</sub> | C <sub>5</sub> | C <sub>6</sub> | C <sub>7</sub> |
| 2            | 0              | X              | X              | X              | X              | X              | X              | X              |
| 3            | 0              | X              | X              | X              | X              | X              | X              | X              |
| ...          | ...            | ...            | ...            | ...            | ...            | ...            | ...            | ...            |
| ...          | ...            | ...            | ...            | ...            | ...            | ...            | ...            | ...            |
| 16           | 0              | X              | X              | X              | X              | X              | X              | X              |

C<sub>1</sub> C<sub>2</sub> C<sub>3</sub> C<sub>4</sub> C<sub>5</sub> C<sub>6</sub> C<sub>7</sub> is the first byte of the string. It is a frame start marker that includes the result of the CRC-7 calculation over the previous frame. C<sub>1</sub> is the Most Significant Bit (MSB.)

0XXXXXXX represents a T.50 character where the other 15 bytes of this format are used to transport 15 T.50 characters. The first bit of every byte is a header bit. The only non-zero bit is found in the first byte of the 16 bytes.





## Optical Channel Trace for OCh10G

---

- Definitions**
- OCh10G** The transport of OC-192/STM-64 signals with Strong Forward Error Correction (FEC) is achieved by adding digital overhead that contains the FEC check bytes and the Optical Channel Overhead (OCh-OH). The resulting signal is transported at approximately 10.7 GB/s. This signal format is referred to as OCh10G (Optical Channel at 10 GB/s).
- OCh-S** The Optical Channel Section (OCh-S) is defined as a portion of a network between adjacent OTUs with FEC processing turned on, where FEC processing, performance monitoring, and maintenance functions are performed.
- OCh-P** The Optical Channel Path (OCh-P) is defined as spanning the distance from that point where an OC-192/STM-64 signal is converted to an OCh10G signal (add mode) to that point where an OCh10G signal is converted to an OC-192/STM-64 signal (drop mode). The path trace can be used to verify connectivity between path terminating network elements, and supports path maintenance.
- Description** The WaveStar® OLS 1.6T OCh10G capable OTUs (that is, OC-192/STM-64 OTUs with Strong FEC) have access to the Optical Channel Path Trace overhead byte. This enables the system to determine if the received trace string matches the expected string at an OCh10G capable OTU.



## Integration and Timing

### Overview

---

**Purpose** This section provides information on the alarm indication signal, alarm timing, and alarm clear delay.



## Alarms Delays

---

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Autonomous Indications</b>      | <p>Autonomous indications of conditions or events are generated when they occur. No user action is required to produce autonomous indications. Autonomous indications appear at the following alarm and status interfaces:</p> <ul style="list-style-type: none"><li>• Alarm Contact Closures to the Office Alarm Grid</li><li>• Craft Interface Terminal (CIT)</li><li>• LEDs on the equipment</li><li>• OS Interfaces</li></ul> |
| <b>On-Demand Indicators</b>        | <p>On-demand indications of conditions or events are generated when requested by the user. On-demand indications appear at the following alarm and status interfaces:</p> <ul style="list-style-type: none"><li>• CIT</li><li>• OS Interfaces</li></ul>                                                                                                                                                                           |
| <b>Reported Items</b>              | <p>Items reported by the Alarm and Status Indicators are as follows:</p> <ul style="list-style-type: none"><li>• Conditions</li><li>• Events</li></ul>                                                                                                                                                                                                                                                                            |
| <b>Conditions</b>                  | <p>Conditions persist in time and indicate there is something non-nominal about the system.</p>                                                                                                                                                                                                                                                                                                                                   |
| <b>Events</b>                      | <p>Events occur at particular times. The four types of events are as follows:</p> <ul style="list-style-type: none"><li>• A condition starting</li><li>• A condition clearing</li><li>• An autonomous action by the system</li><li>• A user action</li></ul>                                                                                                                                                                      |
| <b>Incoming Signal Alarm Delay</b> | <p>When a condition related to an incoming signal is detected, an individual timer is started for that condition. This timer runs until a provisioned interval, called the Incoming Signal Alarm Delay, expires or until it is determined that the condition no longer exists.</p> <p>If, at the end of the Incoming Signal Alarm Delay interval, it is determined that the condition still exists, autonomous indications of</p> |

the condition are generated and on-demand reports will indicate that the condition is active. If the condition is determined to have been cleared, no indications of the condition are generated.

**Alarm Clear Delay**

The Alarm Clear Delay applies individually to conditions related to incoming signal failures. As soon as the system determines that a condition has been cleared, an Alarm Clear Delay timer begins for that condition. The timer runs until a provisioned interval, called the Alarm Clear Delay, expires or until the condition is detected again

If, at the end of the Alarm Clear Delay interval, the condition remains cleared, all indications of the condition are cleared. If the same condition appears during the Alarm Clear Delay interval, all indications remain active.



## Equipment Failure

---

**Description** Equipment failures are reported as soon as the defect is determined to exist. There is no Incoming Alarm Delay and there is no Alarm Clear Delay associated with equipment failures. The alarm for an equipment failure will report the location of the failure to assist the user in trouble-shooting any failures. Refer to "Trouble Clearing Tasks" (13-1) for details on specific alarms.

**Incoming Alarm Delay** There is no Incoming Alarm Delay associated with equipment failures.

**Alarm Clear Delay** There is no Alarm Clear Delay associated with equipment failures.



# Fault Identification

## Overview

---

**Purpose** This section provides information on automatic fault detection and isolation. [For help, refer to "Performance Monitoring" (5-1).]



## Automatic Fault Detection

---

- Description** Maintenance activities are affected by Network Element Type (NETYPE) provisioning and OTPS provisioning as follows:
- Common slots are made known to the software by provisioning the NETYPE
  - Per Channel slots are made known to the software by provisioning OTPS associations.

**Monitored Signal Conditions** Table 6-2 lists incoming signals and associated conditions.

**Table 6-2 Monitored Incoming Signal**

| Incoming Signal Level                    | Conditions                                                                                                                                  |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 10G Multiplexing OTU                     | Optical Payload Label Mismatch, LOS, OLOF, Client Sync Failure, J0 Mismatch, OCh TC-AIS, OC-48 Client FDI, Wave Wrapper path trace mismatch |
| High-Speed Broadband OTU                 | LOS, LOL                                                                                                                                    |
| Optical Redundancy Switch                | LOS                                                                                                                                         |
| OC-48/STM-16 OTU                         | LOS, LOF, AIS-L, J0 Mismatch                                                                                                                |
| OC-192/STM-64 OTU                        | LOS, LOF, Pseudo-AIS, J0 Mismatch                                                                                                           |
| OC-192/STM-64 OTU with FEC (WaveWrapper) | LOS, OLOF, OCh TC-AIS, Wave Wrapper path trace mismatch, OCh Client FDI, OC-192/STM-64 LOF, J0 Mismatch                                     |
| Optical Channel                          | LOS                                                                                                                                         |
| ODU                                      | LOS                                                                                                                                         |
| Supervisory Signal                       | D-LOS, LFA                                                                                                                                  |
| Wavelength Add Drop                      | LOS                                                                                                                                         |

LOS: Loss of Signal

LOL: Loss of Lock (only if provisioned)

LOF: Loss of Frame

AIS-L: Line Alarm Indication Signal

OLOF: Optical Channel Loss of Frame

OC-48 Client FDI: OC-48 Client Signal Forward Defect Indicator

OCh TC-AIS: Optical Channel Tandem Connection Alarm Indication Signal

OCh Client FDI: Optical Channel Client Forward Defect Indicator

D-LOS: Digital Loss of Signal

LFA: Loss of Frame Alignment





## Automatic Fault Isolation and Diagnostics

---

|                           |                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>        | When a trouble condition is detected, the WaveStar® OLS 1.6T isolates the failed circuit pack or signal.                                                                                                                                                                                                                                            |
| <b>Failure Reporting</b>  | Failures are reported to a local technician and operations system for repair.                                                                                                                                                                                                                                                                       |
| <b>Failure Alarming</b>   | The control system examines the indications it receives and determines the most probable cause for the failure (that is, circuit pack or control link). Control failures are automatically alarmed through equipment and office alarm relays, ensuring that the CIT is notified regardless of the effect of the failure on other control functions. |
| <b>Cleared Conditions</b> | When a trouble condition is cleared, automatic diagnostics re-evaluate the related defects in order to isolate another possibly failed circuit pack or signal.                                                                                                                                                                                      |



# Loss of Signal (LOS)

## Overview

---

**Purpose** This section provides information on LOS, optical channel LOS, and the functions of the alarm indicators during a LOS.



## Detecting Incoming LOS at an OA

---

|                             |                                                                                                                                                                                                             |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>          | Each NE that terminates an Optical Transmission Section (OTS) monitors the incoming optical line signals for a LOS.                                                                                         |
| <b>Declaring LOS Defect</b> | The system will detect a LOS defect when the input signal is below a threshold value for a time from 10 to 100 microseconds. A LOS alarm will be raised within 10 milliseconds of the onset of the failure. |
| <b>Clearing LOS Defect</b>  | The system will clear the LOS defect when the power is above a threshold value for a time from 1 to 10 milliseconds.                                                                                        |



## Optical Channel LOS

---

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OA-to-OMON Connections</b>                        | OA-to-OMON fiber connections are verified manually when an OA circuit pack and/or an OMON circuit pack is installed or replaced.                                                                                                                                                                                                                                                                                                                                                      |
| <b>Spectrum Measurements</b>                         | The system software makes spectrum measurements of all OMON input ports with associated OA taps. Spectral measurements are made at least once every 15 minutes. Spectral measurements driven by failure events supersede the minimum measurement schedule.                                                                                                                                                                                                                            |
| <b>LOS at a Local Network Element</b>                | An incoming Optical Channel LOS is detected at the Optical Spectrum Analyzer (OSA) on the OMON circuit pack. This LOS defect is then integrated within 6 to 10 seconds before generating an OCHAN LOS Alarm.                                                                                                                                                                                                                                                                          |
| <b>Declaring and Clearing an Optical Channel LOS</b> | The OMON is used to scan all the channels in use at every NE. These scans are used to localize the signal failure of the channel. The optical channel LOS will be correlated with OMON scans within the line system. OCAIM and OCAIM Yellow are used for signaling purposes to correlate and clear the optical channel LOS.                                                                                                                                                           |
| <b>OCAIM</b>                                         | The Optical Channel Alarm Indication Message (OCAIM) notifies downstream equipment when an incoming optical channel Loss of Signal (LOS) defect is declared at an OA circuit pack. The message contains information on all channels. This message is sent downstream via the Supervisory (SUPVY) Data Link (DL) to suppress or unsuppress the downstream alarms when an incoming optical channel Loss of Signal (LOS) is declared or cleared at a WaveStar® OLS 1.6T Network Element. |
| <b>OCAIM Yellow</b>                                  | The OCAIM Yellow indicator notifies the upstream equipment that an incoming optical channel LOS has been detected. This message requests that the OMON scan at an OA.                                                                                                                                                                                                                                                                                                                 |



# Control System

## Overview

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|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Purpose</b>                               | This section provides information on the various system controllers and their functionality to assist during trouble clearing procedures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Types of Controllers</b>                  | <p>The WaveStar® OLS 1.6T includes four controllers:</p> <ul style="list-style-type: none"> <li>• System Controller</li> <li>• Overhead Controller</li> <li>• Bay Controller</li> <li>• Board Controller</li> </ul> <p>System software monitors the health of each controller, including</p> <ul style="list-style-type: none"> <li>• effect of control failures on the system</li> <li>• detection, isolation, and reporting of control failures</li> <li>• recovery from control failures</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Control System Maintenance Philosophy</b> | <p>The Control System Maintenance philosophy includes:</p> <ul style="list-style-type: none"> <li>• <b>Automatic Fault Recovery</b> — The control system automatically recovers from power surges or interruptions with no WaveStar® OLS 1.6T CIT action required. The system is automatically restored to its state prior to the failure.</li> <li>• <b>Non-Service Affecting (NSA) Control Faults and Processor Resets</b> — Control faults and processor restarts do not affect service. The system continues to operate in the state in which it was operating before the control failure or reset (autonomous or manual) occurred. This includes maintaining existing transmission and protection switching states.</li> </ul> <p>The removal and insertion of a control pack (for example, Bay Controller, System Controller, External Interface, Overhead Controller) in a quiescent system is non-service affecting.</p> |

- Version Recognition**    The WaveStar® OLS 1.6T provides the following version recognition features:
- Automatic identification of the type of circuit pack installed in each slot
  - Hardware and software version recognition
  - Equipment Catalog Item (ECI) version identification for each circuit pack
  - An apparatus code for each circuit pack, which does not change throughout the life cycle of the pack
  - Firmware version recognition using Program IDentification (PID) codes. (The PID codes identify the firmware on all circuit packs, and are independent of the CLEI codes)
  - Manufacturing serial number recognition
  - Automatic version recognition of the system software
  - Software version number



## 10BaseT — Ethernet

---

**Description** The WaveStar® OLS 1.6T includes 10BaseT Ethernet connections through the CIT and OS ports.

[Table 6-3, “10 BaseT Ethernet Interface Types” \(6-21\)](#) lists the supported interfaces to the CIT and OS ports.

**Table 6-3 10 BaseT Ethernet Interface Types**

| Port Type | Supported Interface                                                                       |
|-----------|-------------------------------------------------------------------------------------------|
| CIT       | TL1 over TCP/IP                                                                           |
| OS        | TL1 over TCP/IP<br>TL1 over OSI<br>TL1 over OSI using Transport Service Bridge (RFC-1006) |

**PING Support** The CIT connection supports the PING command, and executes this upon startup.



# Port Associations

## Overview

---

- Purpose** Association information is used by the WaveStar® OLS 1.6T to
- control OTU output;
  - assist OA gain tilt and pump power adjustments;
  - set the expected output frequency and/or wavelength of the OTU circuit pack installed in a particular slot;
  - instantiate slots; and
  - correlate faults.





## Available Associations

---

**Overview** The WaveStar® OLS 1.6T is able to establish the following port associations:

- OTU port to OTU/OMU/ODU/ORS/WAD ports

Associations may also be established between external equipment and OTU, OMU, ODU, ORS, and WAD ports

**Type of Associations** The following associations are available and create or define the relationship between the ports and/or equipment:

- ADD, to define OTU output port to OMU/OTU/WAD input port fiber connections
- DROP, to define ODU/WAD output port to OTU input port fiber connections
- TERMINAL DROP (TDROP), to define OTU output port to external equipment fiber connections
- EXTERNAL ADD (XADD), to define external equipment to OMU/WAD input port fiber connections
- EXTERNAL DROP (XDROP), to define ODU/WAD output port to external equipment fiber connections
- TERMINAL ADD (TADD), to define external equipment to OTU input port fiber connections
- PROTECTION ADD (PADD), to define ORS line output port to OTU input port fiber connections
- PROTECTION EXTERNAL ADD (PXADD), to define external equipment to ORS input port fiber connections
- PROTECTION DROP (PDROP), to define OTU output port to ORS input port fiber connections
- PROTECTION EXTERNAL DROP (PXDROP), to define ORS output port to external equipment fiber connections
- PROTECTION TERMINAL ADD (PTADD), to define external equipment to ORS client input port fiber connections
- PROTECTION TERMINAL DROP (PTDROP), to define ORS output port to external equipment fiber connections







# 7      Alarms and Indicators

## Overview

---

**Purpose**      This chapter provides information on alarm mappings and defines alarm severity assignment profiles.

**Contents**

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| <a href="#">Alarm Severity Assignment Profile (ASAP)</a> | <a href="#">7-4</a> |

# Alarm Mappings

---

**SONET Alarm Definitions** [Table 7-1, “SONET Alarm Definitions” \(7-2\)](#) gives definitions for the alarm severity and control criteria in the SONET environment.<sup>1</sup>

**Table 7-1 SONET Alarm Definitions**

| Alarm Severity | Control Criteria                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Critical       | Critical alarms are used to indicate that a severe, service-affecting condition has occurred, and that immediate corrective action is imperative.                                                                                                                                                                                                                                                           |
| Major          | Major alarms are used for hardware or software conditions that indicate a serious disruption of service or the malfunctioning or failure of important circuits. Major alarms require the immediate response of a craftsperson to restore or maintain system capability. The urgency is less than in critical situations because of a lesser immediate or impending effect on service or system performance. |
| Minor          | Minor alarms are used for situations that do not have a serious effect on service to customers or for trouble in circuits that are not essential to NE operation.                                                                                                                                                                                                                                           |

**Notes:**

1. Telcordia TR-NWT-000474 Network Maintenance: Alarm & Control Criteria Common to Switching and Transport Network Elements.
2. ITU M.20 Maintenance: Introduction and General Principles.

**SDH Alarm Definitions** [Table 7-2, “SDH Alarm Definitions” \(7-2\)](#) gives definitions for the alarm severity in the SDH environment.<sup>1</sup>

**Table 7-2 SDH Alarm Definitions**

| Alarm Severity                 | Definitions                                                                                                                                                                                                                          |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prompt Maintenance Alarm (PMA) | A PMA is generated in order to initiate immediate maintenance activities by maintenance personnel to remove defective equipment from service for the purpose of restoring good service and effecting repair of the failed equipment. |

**Table 7-2 SDH Alarm Definitions (continued)**

| Alarm Severity                   | Definitions                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Deferred Maintenance Alarm (DMA) | <p>A DMA is generated when immediate action is not required by maintenance personnel. For example:</p> <ul style="list-style-type: none"> <li>• When performance falls below a set threshold but the effect does not warrant removal from service.</li> <li>• When automatic changeover to stand-by equipment has been used to restore service.</li> </ul> |

**Supported Alarm Attributes** A single, user-provisioned parameter determines the set of supported attributes. The parameter value may be SONET or SDH,

- When this parameter is set to SONET,
  - supported alarm indicators are:  
CRITICAL  
MAJOR  
MINOR  
NOT ALARMED  
NOT REPORTED
  - Supported status indicators are:  
ABNORMAL  
ALARM CUT-OFF  
NEAR-END ACTIVITY
- When this parameter is set to SDH,
  - supported alarm indicators are:  
PROMPT  
DEFERRED  
NO ALARM  
NO REPORT
  - Supported status indicators are:  
ABNORMAL  
SUPPRESS  
INFORMATION

□

## Alarm Severity Assignment Profile (ASAP)

---

**Definition** Alarm Severity Assignment Profile (ASAP) associates a set of alarm severities with one or more Alarm Identifiers (Alarm IDs).

**ASAP Profile Types** Twelve ASAP types are supported as follows:

- bay (Bay)
- client (Client Signal)
- com (General Communication)
- env (Environment)
- ochan (Optical Channel)
- oline (Optical Line)
- pack (Circuit Pack)
- shelf (Shelf)
- slot (Slot)
- supvy (Supervisory Port)
- sw (Software)
- system (System)

**Default Profile** There is one Default Profile for each ASAP type that cannot be deleted. The Alarm IDs included in the Default Profile are fixed and are not user-provisionable.

**User Created Profiles** Up to 88 additional user-created profiles (of any type) may be defined. These user-created profiles are distinguished by their profile names. Each profile contains the same (non-provisionable) set of Alarm IDs as the Default Profile. The alarm severities are provisionable in each user-defined profile.

### Creating a User-Defined ASAP

New ASAP types are created using the ENT-ASAP-PROF TL/1 command. Each new profile is an exact duplicate of any existing profile, as selected by the user.

### Customizing a New User-Defined ASAP

Alarm severities for user-defined ASAP types may be customized using the ED-ASAP-PROF TL/1 command.

**Deleting a User-Defined ASAP**

Any user-created ASAP is deleted using the DEL-ASAP-PROF TL/1 command.

**Important!** Default ASAP cannot be deleted.

**Retrieving ASAP Contents**

The contents of any ASAP are retrieved using the RTRV-ASAP-PROF TL/1 command.

**Associating ASAP to AIDs**

Each Access Identifier (AID) in a network element for which an Alarm ID can be reported is associated with one or more types of ASAP profiles. This is exactly one profile of each such assigned type. The set of ASAP profiles assigned to each AID is fixed, and cannot be changed by the user.

For example, each Access Identifier (AID) of type LINE is assigned one profile of type supvy, and one profile of type oline.

**Changing an ASAP Name**

The user is able to change the name of the ASAP of a particular type assigned to a particular AID using the ENT-PROF-ASGNMT TL/1 command.

**Retrieving an Assigned ASAP**

A user can retrieve a report showing the ASAP(s) assigned to a specified AID(s) using the RTRV-PROF-ASGNMT TL/1 command.

The user can retrieve a report showing the AID(s) assigned to a specific ASAP using the RTRV-AID-ASGNMT TL/1 command.









# 8 Automatic Power Shutdown (APSD)

## Overview

---

**Purpose** This chapter summarizes information on Automatic Power Shutdown (APSD). APSD is required by both the US and international markets in order to meet customer requirements for a safer working environment under the guidelines for laser products.

**Contents**

|                                                               |                     |
|---------------------------------------------------------------|---------------------|
| <a href="#">APSD</a>                                          | <a href="#">8-2</a> |
| <a href="#">Safety Requirements</a>                           | <a href="#">8-5</a> |
| <a href="#">APSD Trigger Conditions and Restart Procedure</a> | <a href="#">8-8</a> |



# APSD

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**Theory of Operation** The purpose of automatic power shut-down (APSD) is to comply with IEC Hazard Level 1 requirements and create a safe environment for the transmission facility maintenance team to perform repairs to damaged fibers that are transmitting high power. The APSD feature brings the optical amplifier output power and pump output power to safe levels in the event of a fiber cut, removed connector, or equipment failure. After the system has been repaired or links have been re-established, APSD also ensures restoration to normal operation. Powers as high as +23 dBm are expected for an 80-channel application.

APSD is unavailable as follows:

- When the System/Bay<sup>1</sup> Controller, Supervisory, or Transmit OA pack resets, APSD is unavailable until the pack is rebooted.
- When a failure occurs in the System/Bay<sup>1</sup> Controller, Supervisory, or Transmit OA packs, APSD is unavailable until the pack is replaced and the system rebooted.
- When the removal of a System/Bay<sup>1</sup> Controller pack occurs, APSD is unavailable until the pack is inserted and the system rebooted.
- When there is a shelf power failure that occurs in a shelf where the System/Bay<sup>1</sup> Controller resides, APSD is unavailable until power is restored and reboot is complete.
- In the event that an Overhead Controller resets/is removed/fails at the same time a single fiber cut occurs, APSD is not available (in the adjacent NE Transmit OA that drives the cut fiber) until the Overhead Controller is rebooted/replaced and the fiber cut condition is repaired. Users should repair the fiber cut condition and the failed pack as soon as possible to prevent any accessible laser emissions from causing injury.
- When a user-initiated upgrade or re-provisioning of certain parameters takes place (for example, executing the INIT-SYS, ENT-SYS, PROV-SYS, ENT-OSI, ENT-RMA, ENT-TSB TL1 commands), APSD may not be available until the reboot is complete.

- In the event that a System/Bay<sup>1</sup>/Overhead controller hangs up, the software automatically initiates a system reboot to bring itself out from that state. APSD is not available until the reboot is complete.
- When a user decides to do a manual reset of the system by pressing the restart button on the EI pack, APSD is not available until the reboot is complete.
- In the event of an electrical power disruption, the Quick Transmission Feature (QTF) was offered to re-establish transmission (with optical power levels set to where they were before the glitch) within 5 minutes of power being restored. However, this occurs before the system is completely rebooted; thus APSD is not available until the system reboot is completed.  
<sup>1</sup>This applies to Bay Controller that controls OA/WAD/ODU

**Important!** The system reboot time is 15 to 20 minutes.

#### Scenarios for APSD

The following scenarios can initiate APSD:

- Disruption of an optical fiber(s) that connect two network elements (NEs)
- Disruption of an optical fiber that connects the output of an OA circuit pack to the input of an ODU1 circuit pack, and a failure or removal of an ODU circuit pack
- Disruption of an internal optical fiber that connects the output of an OA circuit pack to the input of a WAD circuit pack, failure or removal of a WAD circuit pack.
- Receive OA failures
- Power failures

#### Fiber cut between two NEs

A Network Element (NE) can be an End or Ring Terminal, a Repeater, or a WAD.

When there is fiber(s) cut between the two NEs, OLS 1.6T network element detects an optical line LOS and a supervisory LOS on either line 1 or line 2, turns off the optical power at the output port of the corresponding OA circuit pack within one second, and informs the NE at the other end of the span (downstream NE) to do the same on the affected line 1 and/or 2. The NE at each end of the affected span declares an APSD condition in addition to activating the optical line LOS alarms (if appropriate) which are reported to the CIT and OS.

When the fiber(s) are restored, supervisory LOS clears at the NE(s) and the supervisory data link is restored. The upstream NE checks for the supervisory Line 1 and Line 2 mismatch, OA connection mismatch and insufficient span loss. The downstream NE does the same thing. If the NE passes all these checks, the NE(s) generate(s) an APSD-clear message which is reported to the CIT and OS, and the OLS 1.6T NEs at each end of the span returns the OA power to normal operation. If the NE finds a failure on any of these checks, the NE(s) declares the failure condition which is reported to the CIT or OS, and the OA power will not restore the OA output power to normal operation.

**Important!** The Type 2 WAD does not require APSD.

**LOS at ODU1C Input,  
Failure or Removal of  
ODU1C or ODU2C**

When the NE detects a LOS at the input to an ODU1C circuit pack, the NE lowers the output power of the connecting OA to +10 dBm within one second, and declares an APSD condition which is reported along with the ODU1C LOS or removal to the CIT and OS.

When a NE detects the failure or the removal of an ODU1C (ODU2C if there is an association to the pack) circuit pack, the NE turns off the output power of the driving OA within one second, and declares an APSD condition which is reported along with the ODU1C or ODU2C failure or removal to the CIT and OS.

When the LOS clears, ODU failure clears or the ODU removal clears, the NE increases the output power of its receive OA incrementally back to its operating power. The NE reports a LOS-clear, ODU failure clear or the ODU removal clear, and APSD-clear messages to the CIT and OS.

□

## Safety Requirements

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### **IEC Laser Safety Hazard Levels**

International Electro-technical Commission (IEC)-825 Parts 1 and 2 (issued 1993) specify the laser safety hazard levels. Products to be marketed as a Class 1 system with Hazard Level 1M circuit packs are safe and recommended by the IEC. The WaveStar® OLS 1.6T system uses laser equipment at 1550 nm, and meets or exceeds the requirements of the IEC Hazard Level 1M classification.

### **WaveStar® OLS 1.6T APSD Criteria**

The WaveStar® OLS 1.6T system incorporates the following criteria in order to satisfy the IEC Hazard Level 1 requirements:

- Automatic power reduction mechanisms are employed on all outputs that exceed Class 1M laser safety limits. Therefore, any output that exceeds 17 dBm (or 50 mW) at 1550 nm on an 8.8 micron core, single mode fiber, incorporates APSD safety mechanisms.
- After APSD has been triggered and the optical output power reduced, the optical power may not exceed the Class 1 limit for that wavelength, which is 10 dBm (or 10 mW) for 1550 nm on a single mode fiber with an 8.8 micron core. This is required to obtain a Hazard Level 1 category.
- The automatic power reduction must take place no more than one second after the fiber disconnect or fiber break. This is an upper limit.
- The maximum power during the shutdown may not exceed 1.26 Watts (31 dBm) at 1550 nm on a single mode fiber with an 8.8 micron core.
- Restart of the signal may not occur within 99 seconds of the fiber disconnect or fiber break. This interval may be shorter if the continuity of the link can be verified before restart commences.

**Laser Safety and Lucent Products**

Lucent is committed to design optical fiber transmission equipment that minimizes operator and service personnel exposure to potentially hazardous levels of optical energy during service and operation. However, the continued safe use of optical transmission, optical cables and passive optical connection equipment requires a partnership with customers to assure that these systems are deployed and maintained in a safe manner. While automatic laser power reduction systems in Lucent's higher power transmission equipment respond quickly to reduce laser emissions to safe levels in the event of a fiber disconnection or break, network operators must take proper action in the event of an alarm.

In a typical network, our optical cables and passive optical connection equipment can carry signals from various vendor sources that may have different degrees of safety controls. We urge our customers to properly assess the power of these sources to ensure that their safety controls are adequate.

To strengthen our partnership and to assure the continued safe deployment and use of optical networks, we urge you to use the following standards as your guides for laser safety for your customers and employees:

1. In the U.S.:  
***ANSI Z136.1 - American National Standard for Safe Use of Lasers***, and  
***ANSI Z136.2 - American National Standard for Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources***.
2. Elsewhere:  
***IEC 60825 Safety of Laser Products Part 1: Equipment classification, requirements and user's guide***  
***IEC 60825 Safety of Laser Products Part 2: Safety of optical fiber communication systems***

**Important!** It should be noted that recent studies in Europe have suggested that power as low as 50 mW can ignite certain hazardous (classified) gaseous/vapor/mist/dust environments under worst case, dusty conditions. Standards are being written, both in the US and the International Electrotechnical Commission (IEC), to address optical installations in hazardous (classified) environments. If you must deploy high power systems in such environments, you should assess the impact.

**Optical Safety (FDA/CDRH Class I and IEC-60825-1 Class 1 Classification)**

The WaveStar® OLS 1.6T system is classified as an FDA/CDRH Class I and an IEC-60825-1 Class 1 laser product and assessed as an IEC-60825-2 Hazard Level 1M system as referenced in the Interpretation Sheet 76/224/ISH to IEC-60825-1, Amendment 2, January 2001, for use in IEC-60825-2.

**IEC-60825-1 Class 1 Laser Product**

Any end-to-end optical fiber communication system using enclosed or embedded laser transmitters or regenerators are designated as a Class 1 Laser Product. The total system is considered "closed" under normal operating conditions (that is, connectors are terminated and covers are closed) and is therefore categorized by IEC 60825 (issued 1993) as a Class 1 system.

**Hazard Level Definition**

**Hazard Level** refers to the potential hazard from laser emissions at any location in an end-to-end optical fiber communication system that may be accessible *during service or in the event of a failure*.

**Circuit Pack Classifications**

Without an APSD procedure, the 1.6T OA output port power exceeds the Hazard Level 1M category. Therefore, the APSD procedure shall be performed on the OA output port to obtain the Hazard Level 1 Category.

The 1.6T ODU1, OA (DCM output port) and DCM output port are in the Hazard Level 1M category and do not require the APSD procedure.

The output ports of all remaining 1.6T circuit packs are in the Hazard Level 1 category and do not require the APSD procedure.

**APSD Restart**

Once a system has been repaired or the links have been re-established, APSD restores normal operation within five minutes.

□

## APSD Trigger Conditions and Restart Procedure

---

### Basic Theory of Operation for Fiber Cut Between Two NEs

When a fiber is cut from an OA in a NE to another OA in the downstream NE APSD is triggered. The scenarios that follow explain what happens when this occurs:

#### Two fiber cut scenario

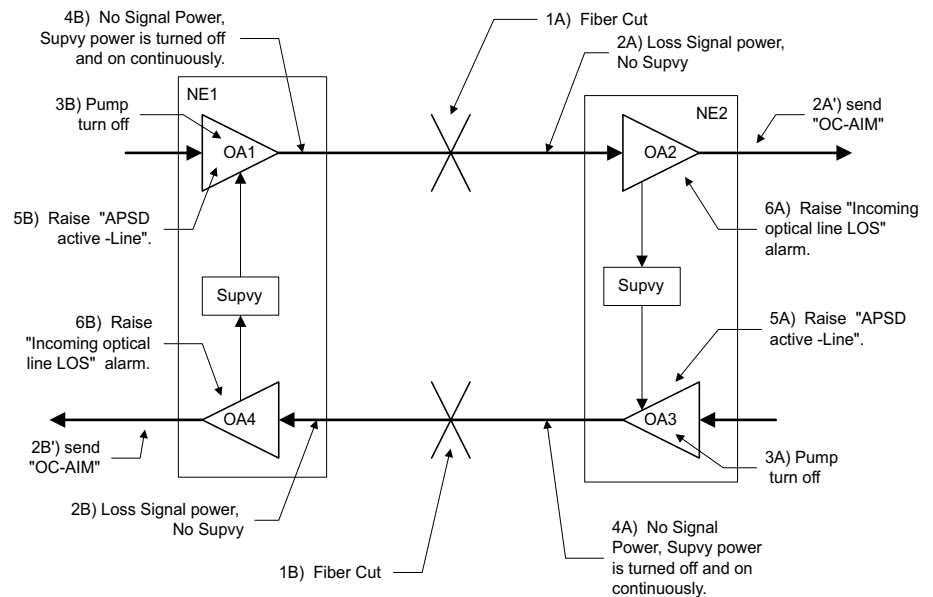
[Figure 8-1, “APSD for a Two Fiber Cut Scenario” \(8-9\)](#) illustrates the automatic power shutdown procedure. Steps 1A to 6A show the automatic power shutdown procedure for OA3 in NE2. Similarly, steps 1B to 6B shows the automatic power shutdown for OA1 in NE1.

1. **1A**- A fiber that connects the OA1 and OA2 is cut.
2. **2A** - A loss of signal power is detected in the OA pack and a loss of supervisory signal power is detected on the SUPVY pack in Network Element 2 (NE2).
3. **3A** - Software shuts down the power of the driving pumps of OA3 completely.
4. **4A** - Software turns off and on continuously (pulsing) the supervisory signal power to NE1.
5. **5A** - Software raises “APSD - Active Line” condition with the OA that has power off (OA3) specified in the AID field.



6. **6A** - Software raises the Incoming Optical Line LOS Alarm when the SUPVY pack in the NE2 detects constant loss of supervisory signal power (that is not the "APSD pulsing of the supervisory signal power" signature).

**Figure 8-1 APSD for a Two Fiber Cut Scenario**



### APSD Restart Scenario

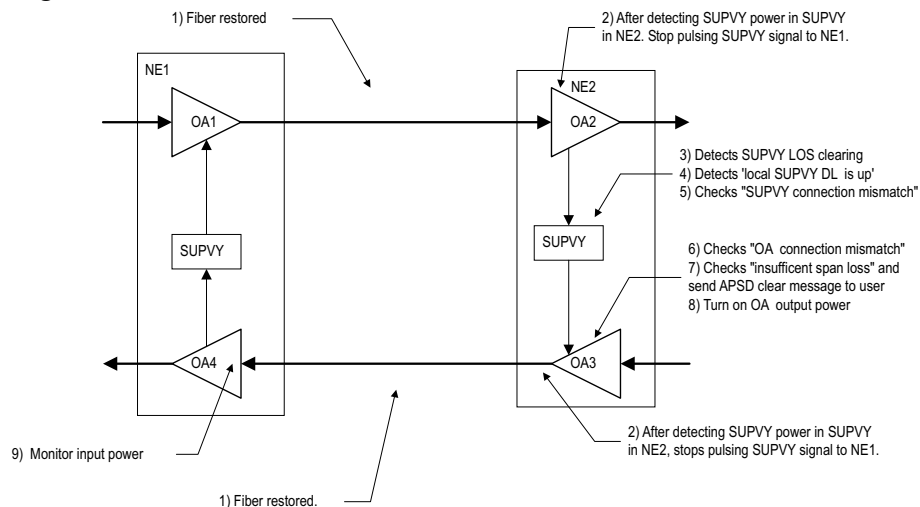
[Figure 8-2, "APSD Restart for Two-Fiber Cut Scenario" \(8-10\)](#)

illustrates the steps explained below:

1. Both fiber connections from NE1 and NE2 are restored.
2. SUPVY pack in NE2 detects the "supervisory signal". NE2 stops pulsing and turns on the supervisory signal power to Node NE1.
3. SUPVY LOS clearing shall be detected on an optical line with LOS present and APSD active.
4. NE2 checks for Local SUPVY data link (DL) recover on the optical line.
5. NE2 checks that the correct SUPVY line connection has been made. If there is a mismatch, the Software reports an "SUPVY line-1 and line-2 connection mismatch" condition.
6. NE2 checks that the correct OA-to-OA connection has been made.
7. NE2 checks for insufficient span loss less than 10 dB condition.

8. NE2 clears "APSD active -line" condition. NE2 turns on OA3 output power to a level that reflects its input power.
9. APSD Restart is done. OA in NE2 starts monitoring input power for APSD triggering conditions.  
A similar procedure is performed to restart the OA1 power on NE1.

**Figure 8-2 APSD Restart for Two-Fiber Cut Scenario**



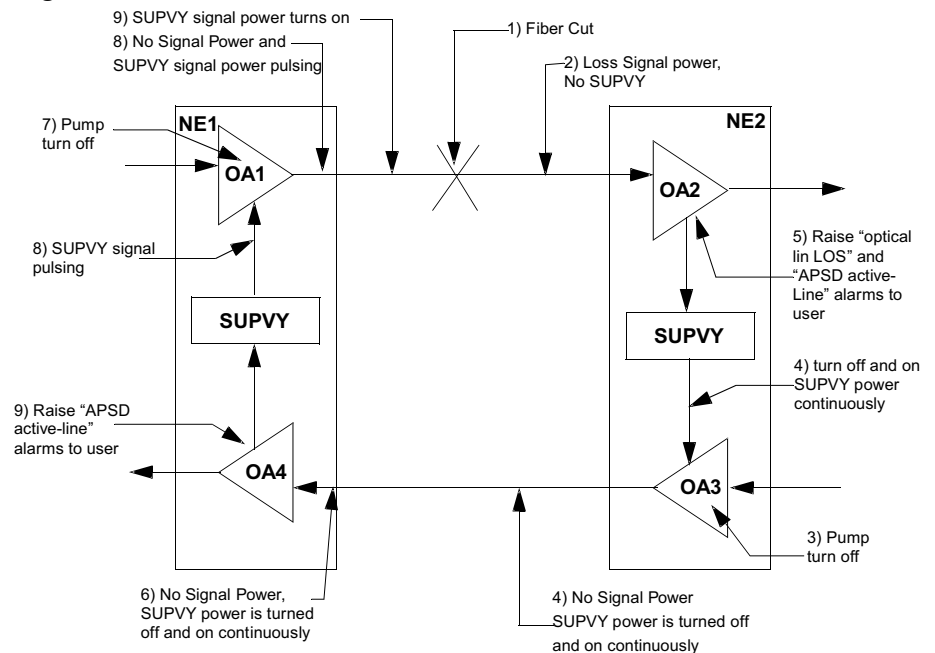
### APSD for One-Fiber Cut Scenario

[Figure 8-3, "APSD for One-Fiber Cut Scenario" \(8-11\)](#) illustrates the automatic power shutdown procedure.

1. A fiber that connects the OA1 and OA2 is cut.
2. A loss of signal power is detected in the OA pack and a loss of supervisory signal power is detected on the SUPVY pack in Network Element 2 (NE2).
3. **3A** - Software shuts off the power of the driving pumps of OA3 completely.
4. Software turns off and on continuously (pulsing) the supervisory signal power. (Turning the supervisory signal power off and on continuously signals the Network Element 1 (NE1) to shut down OA1).
5. The SUPVY pack in the Network Element 2 (NE2) detects constant loss of supervisory signal power. The NE raises "APSD Active-Line" alarm message with the OA (OA3) that has power off specified in the AID field.

6. No fiber cut here from OA3 to OA4. Upon the receipt of the falling edge of the first pulse of the supervisory signal, a loss of signal of payload power is detected at the input of OA4, and a loss of supervisory signal power is detected at SUPVY circuit pack in NE1.
7. Software completely shuts off the power of OA1 pumps.
8. Software turns off and on (pulsing) the supervisory signal power to NE2. After a period of integration time, OA4 detects "APSD's pulsing of the supervisory power" signature. NE1 stops pulsing and turns on the supervisory signal power to NE2.
9. NE1 raises the "APSD Active - Line" alarm.

**Figure 8-3 APSD for One-Fiber Cut Scenario**



### Trigger Conditions

The following table describes the Trigger Conditions for the Automatic Power Shut Down (APSD) that may occur. The detection of these conditions in a NE triggers Automatic Shutdown of the transmit OA in the upstream NE.

| Trigger Condition       |
|-------------------------|
| OA_LOS and SUPVY_LOS or |

| Trigger Condition               |
|---------------------------------|
| OA_LOS and SUPVY_Removal or     |
| OA_LOS and SUPVY_Failure or     |
| OA_LOS and OHCTL_Removal or     |
| OA_LOS and OHCTL_Failure or     |
| OA_Removal and SUPVY_LOS or     |
| OA_Removal and SUPVY_Removal or |
| OA_Removal and SUPVY_Failure or |
| OA_Removal and OHCTL_Removal or |
| OA_Removal and OHCTL_Failure or |
| OA_Failure and SUPVY_LOS or     |
| OA_Failure and SUPVY_Removal or |
| OA_Failure and SUPVY_Failure or |
| OA_Failure and OHCTL_Removal or |
| OA_Failure and OHCTL_Failure    |

**Important!** The OA\_LOS is the Loss of Signal of traffic detected in the OA Pack. The SUPVY\_LOS is the Loss of Signal for the incoming supervisory signal detected in the Supervisory Pack.

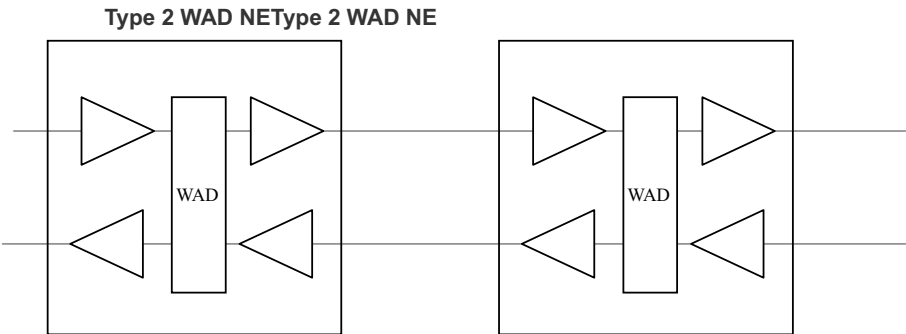
### Basic Theory of Operation for WAD Configurations between two NEs

APSD will be triggered when there is a fiber cut from transmit OA output to outside plant fiber to receive OA pack input in remote NE.

See [Figure 8-4, “Type 2 WAD Applications” \(8-13\)](#) for an illustration of the Type 2 WAD application

APSD will not be triggered when there is a fiber cut anywhere within the WAD NE, from the receive to the OA output.

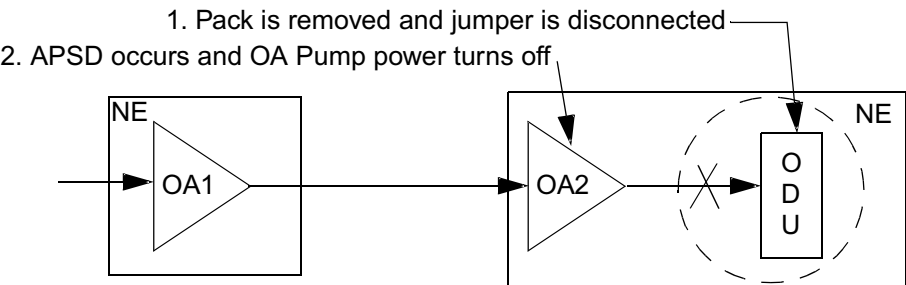
Figure 8-4 Type 2 WAD Applications



**Basic Theory of Operation for an OA to ODU within the Same NE**

See ODU APSD triggering conditions and APSD restart scenario described previously in section, [“LOS at ODU1C Input, Failure or Removal of ODU1C or ODU2C” \(8-4\)](#).  
[Figure 8-5, “OA to ODU - Removing an ODU pack” \(8-13\)](#) illustrates how APSD is triggered when the ODU1 is removed.

Figure 8-5 OA to ODU - Removing an ODU pack



**Other Trigger Conditions**

The APSD trigger conditions that may occur are described in the table that follows. The detection of these ODU conditions trigger Automatic Power Shutdown of the associated OA that is driving the ODU within the same NE.

| Trigger Condition |
|-------------------|
| ODU1_LOS          |
| ODU1_Failure      |

| Trigger Condition                               |
|-------------------------------------------------|
| ODU1_Removal                                    |
| ODU2_Failure (when there are ODU2 associations) |
| ODU2 Removal (when there are ODU2 associations) |

**Two Separate Fiber Cuts -  
One on Both Sides of a  
WAD or Ring Terminal**

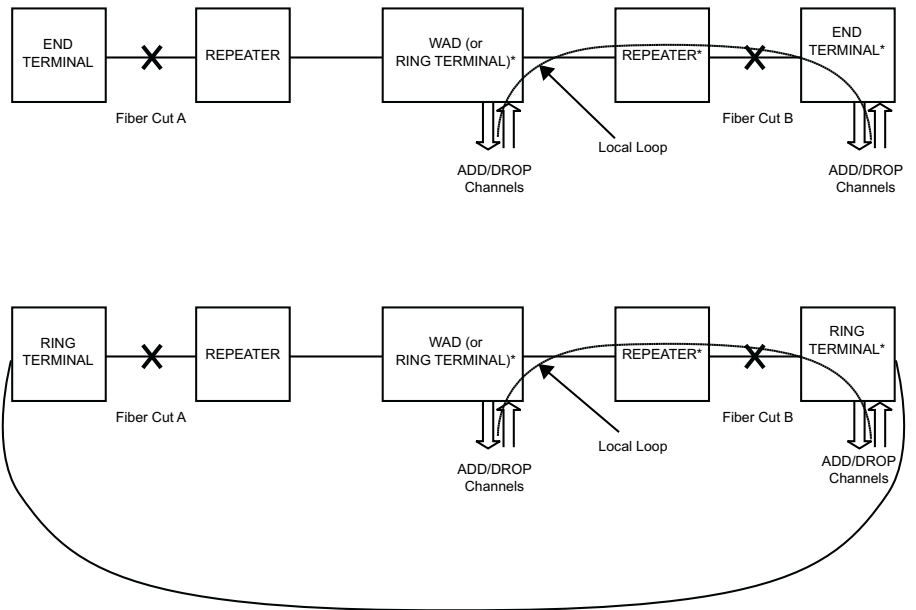
When there are two fiber cuts, on both sides of a WAD or Ring Terminal, the through channels will not be restored until both fiber cuts are restored. APSD will be triggered at both locations. If one of the fiber cuts is restored, APSD will recover and any add/drop channels in the local loop carried over the restored fiber cut will be restored. The through channels will not be restored since one fiber cut still remains.

The figure above shows an example of two separate fiber cuts on both sides of a WAD or Ring Terminal. In the example there are two separate fiber cuts, Fiber Cut A and Fiber Cut B. If Fiber Cut B is restored, APSD will recover at the NEs bounding Fiber Cut B. The add/drop channels between the WAD (or Ring Terminal) and the End Terminal (or Ring Terminal) carried over Fiber Cut B would be

restored. The through channels will not be restored since Fiber Cut A still exists and APSD is still active on the NEs bounding Fiber Cut A.

**Figure 8-6 APSD for a Two Fiber Cut Scenario**

\*If any of these NEs are rebooted, transmission will not be restored on the Local Loop even after Fiber Cut B is restored.









# 9 Using the Index Lists and Procedures

## Overview

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**Purpose** This chapter provides information for using the Index Lists (IXLs), Non-Trouble Procedures (NTPs), Task Oriented Procedures (TOPs), Trouble Assistance Procedures (TAPs), and Detail Level Procedures (DLPs) to perform acceptance, circuit order, operation, and trouble clearing tasks necessary to the WaveStar® OLS 1.6T.

Use of these procedures should be preceded by a general knowledge and understanding of the software for the OLS.

### Contents

|                                            |                     |
|--------------------------------------------|---------------------|
| <a href="#">Getting Started</a>            | <a href="#">9-2</a> |
| <a href="#">Master Task Index</a>          | <a href="#">9-5</a> |
| <a href="#">Recommended Test Equipment</a> | <a href="#">9-7</a> |



# Getting Started

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- Chapter Organization**    The procedural chapters in the paper version of this document are marked with colored tabs and provide the following information:
- The **Acceptance** tab (Yellow) covers procedures that are used to accept the hardware AFTER installation by someone else.
  - The **Circuit Order** tab (Orange) covers procedures that are used when adding or deleting an OC-48/STM-16 channel or an OC-192 channel to an in-service OLS.
  - The **Operations** tab (Green) covers procedures that can be used in day-to-day operations. Such procedures are to enter/change/delete a user login, to initiate or terminate a login session to a remote network element. A complete index listing is in "Operations Tasks" (12-1).
  - The **Trouble Clearing** tab (Red) covers procedures on clearing the "condition" that caused the alarm and clearing trouble reports. These procedures are consistent with the maintenance philosophy given in ["TAP-100: Technical Assistance" \(13-6\)](#).
  - The **Detailed Level Procedures (DLP)** tab (Blue) contains detailed "how to" instructions, beginning with ["DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)" \(14-5\)](#).

Some procedures have an introductory overview section that explains the purpose of the procedure. Other procedures contain self-explanatory titles.

- Locating the Desired Procedure**    Perform the following steps to locate the desired procedure.
1. Determine the Procedure Classification for the task to be performed. For help, refer to Table 9-1, "Procedure Classifications" (9-3).  
If unsure about classification for a task, refer to the Table 9-4, ["Master Task Index" \(9-5\)](#).
  2. After the Procedure Classification has been determined, proceed to the corresponding Task Index. Refer to [Table 9-2, "Task Index" \(9-3\)](#).

Each Task Index lists the available procedures for its classification. All procedures are directive in nature and consist of step-by-step instructions. [Table 9-3, “Types of Procedures” \(9-4\)](#) lists the different types of procedures that may be included for any task classification.

3. Locate the desired procedure from the Task Index, and go to the indicated task number.
4. Perform all steps in the procedure, including referring to other procedures as required. Typically, when referencing another directive-type procedure, it is not necessary to return to the calling procedure. However, when a non-directive Detailed Level Procedure (DLP) has been completed, it is important to return to the calling procedure.
5. Refer to “IXL-001: Trouble Clearing Task Index” (13-2) and “Trouble Condition — TAP Cross Reference” (13-6) to begin troubleshooting if asked to verify an expected system response and that response is not observed.
6. If the fault is still present after completing all applicable trouble-clearing procedures, contact the local or regional maintenance assistance group

**Table 9-1 Procedure Classifications**

| Classification           | Description                                                                         |
|--------------------------|-------------------------------------------------------------------------------------|
| Acceptance               | Procedures used to accept OLS systems AFTER installation.                           |
| Circuit Order            | Procedures used when adding or deleting work order items to an in-service OLS.      |
| Operations               | Procedures used in day-to-day operations.                                           |
| Trouble Clearing         | Procedures used to clear conditions that cause alarms and trouble clearing reports. |
| Detailed Level Procedure | Detailed instructions.                                                              |

**Table 9-2 Task Index**

| Classification | Tab    | Corresponding Task Chapter                                                            |
|----------------|--------|---------------------------------------------------------------------------------------|
| Acceptance     | Yellow | “Acceptance Tasks” (10-1),<br>refer to the “IXL-001:<br>Acceptance Task Index” (10-2) |

**Table 9-2 Task Index (continued)**

| <b>Classification</b>     | <b>Tab</b> | <b>Corresponding Task Chapter</b>                                                              |
|---------------------------|------------|------------------------------------------------------------------------------------------------|
| Circuit Order             | Orange     | "Circuit Order Tasks" (11-1), refer to the "IXL-001: Circuit Order Task Index" (11-2)          |
| Operation                 | Green      | "Operations Tasks" (12-1), refer to the "IXL-001: Operations Tasks Index" (12-2)               |
| Trouble Clearing          | Red        | "Trouble Clearing Tasks" (13-1), refer to the "IXL-001: Trouble Clearing Task Index" (13-2)    |
| Detailed Level Procedures | Blue       | "Detail Level Procedures" (14-1), refer to the "IXL-001: Detail Level Procedures Index" (14-2) |

**Table 9-3 Types of Procedures**

| <b>Procedure</b>           | <b>Description</b>                                                        |
|----------------------------|---------------------------------------------------------------------------|
| Non-Trouble-clearing (NTP) | Normal work items other than trouble clearing.                            |
| Trouble Analysis (TAP)     | Step-by-step trouble clearing instructions to locate and/or fix troubles. |
| Detailed Level (DLP)       | Step-by-step procedures.                                                  |



# Master Task Index

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**Master Task Index** [Table 9-4, “Master Task Index” \(9-5\)](#) is lists all documented tasks.

**Table 9-4 Master Task Index**

| Task Description                                                                          | Classification           | Procedure                                                                                                   |
|-------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------|
| Accept WaveStar® OLS 1.6T                                                                 | Acceptance               | “NTP-002: Accept WaveStar® OLS 1.6T” (10-3)                                                                 |
| Add Optical Channel to In-Service WaveStar® OLS 1.6T                                      | Circuit Order            | “NTP-002: Add Optical Channel to In-Service WaveStar® OLS 1.6T” (11-3)                                      |
| Clear CR/PROMPT, MJ/DEFERRED or MN LED                                                    | Trouble Clearing         | “TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-5)                                              |
| Clear Trouble in CIT (CIT Does Not Respond to Commands)                                   | Trouble Clearing         | “TAP-128: Clear Trouble In CIT (CIT Does Not Respond to Commands)” (13-74)                                  |
| Clear Trouble Report                                                                      | Trouble Clearing         | “TAP-104: Clear Trouble Report” (13-14)                                                                     |
| Copy Software From One Network Element to Another Network Element                         | Operation                | “NTP-003: Copy Software from One Network Element to Another Network Element” (12-5)                         |
| Delete Optical Channel from In-Service WaveStar® OLS 1.6T                                 | Circuit Order            | “NTP-006: Delete Optical Channel from In-Service WaveStar® OLS 1.6T” (11-9)                                 |
| Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT     | Detailed Level Procedure | “DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” (14-43)    |
| Install Software (Initial Installation/Upgrade/Change) into the CIT and a Network Element | Operation                | “NTP-002: Install Software (Initial Installation/Upgrade/Change) into the CIT and a Network Element” (12-3) |
| Restore Network Element After Power Loss                                                  | Trouble Clearing         | “TAP-130: Restore Network Element Operation After Power Loss” (13-79)                                       |

**Table 9-4 Master Task Index (continued)**

| <b>Task Description</b> | <b>Classification</b> | <b>Procedure</b>                       |
|-------------------------|-----------------------|----------------------------------------|
| Technical Assistance    | Trouble Clearing      | "TAP-100: Technical Assistance" (13-3) |



## Recommended Test Equipment

---

### Equipment for Procedures

First-line Maintenance Engineers will require the following as basic equipment to resolve field problems:

- PC with correct CIT software version
- CD version of Documentation (U/SM, IM, APG, etc.)
- Optical Power Meter
- CIT Crossover LAN Cable
- Fiber Scope
- LBO (values 0–20 dbm) and Fiber Kit
- LBO Adapters (Black Coupler, etc.)
- Fiber Cleaning Equipment (Clentop, etc.)

Ordering information for this equipment is listed in the WaveStar® OLS 1.6T Installation Manual in Chapter 1 – Tools and Test Equipment.

Additional equipment may be required depending upon the alarm condition.

[Table 9-5, “List of Recommended Test Equipment” \(9-7\)](#) , provides a equipment that first-line Maintenance Engineers may need prior to being dispatched to work field problems. Ordering information for this equipment is listed in the WaveStar® OLS 1.6T Installation Manual in Chapter 1 – Tools and Test Equipment.

**Table 9-5 List of Recommended Test Equipment**

| Equipment/Accessories   | Signal Types   | Purpose/Required Specifications                                                                                               |
|-------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------|
| Multi -wavelength Meter | Not applicable | Measures wavelengths from 1530 nm to 1562 nm and power up to +5 dBm (at OA MON ports, ODU, OMU, or OTU output port), and OSNR |
| OC-48 Test Set          | OC-48          | Measures BER and B1 errors                                                                                                    |
| OC-192 Test Set         | OC-192         | Measures BER and B1 errors                                                                                                    |
| Power Meter             | Not applicable | Measures up to +5 dBm (at OA MON ports, ODU, OMU, SUPVY or OTU output port.)                                                  |

**Table 9-5 List of Recommended Test Equipment (continued)**

|                                          |                |                           |
|------------------------------------------|----------------|---------------------------|
| Optical Spectrum Analyzer (OSA)          | Not applicable | System/Channel monitoring |
| Optical Time Domain Reflectometer (OTDR) | Not applicable | Monitor fiber conditions  |

**Notes:**

1. Equipment made by other vendors is acceptable only if the equipment meets listed requirements.
2. Lucent-recommended calibration period: Annually.

**Faulty Equipment** Return faulty equipment to the following address for repair:  
Lucent Technologies Network Systems  
Returned Goods Dept.  
Dept. 11MV287122  
1600 Osgood Street  
North Andover, Massachusetts 01845







# 10    Acceptance Tasks

## Overview

---

**Purpose**    *Acceptance Tasks* are procedures used to accept hardware *after* installation by someone else. See [Table 10-1, “Acceptance Task Index” \(10-2\)](#) for a list of procedures.

**Contents**

|                                                    |                      |
|----------------------------------------------------|----------------------|
| <a href="#">IXL-001: Acceptance Task Index</a>     | <a href="#">10-2</a> |
| <a href="#">NTP-002: Accept WaveStar® OLS 1.6T</a> | <a href="#">10-3</a> |



# IXL-001: Acceptance Task Index

---

**Acceptance Procedure**  
**Table 10-1 Acceptance Task Index**

| Task Description                                    | Procedure                                                    |
|-----------------------------------------------------|--------------------------------------------------------------|
| Accept WaveStar OLS 1.6T User/Service Manual (U/SM) | <a href="#">“NTP-002: Accept WaveStar® OLS 1.6T ” (10-3)</a> |



## NTP-002: Accept WaveStar® OLS 1.6T

---

This acceptance procedure can be performed from any OLS network element connected in the system. This procedure is only used if the OLS was installed by someone else. If the installation has not been completed, notify the installation personnel or refer to the **WaveStar® OLS 1.6T Installation Manual** to complete the installation.

***Do not perform this procedure if you completed the installation following the procedures in the WaveStar® OLS 1.6T Installation Manual.***

### Required Test Equipment

The following test equipment is required:

- Craft Interface Terminal (CIT)
- Wrist Strap



### WARNING

***Unterminated optical connectors may emit invisible laser radiation. Eye damage may occur if beam is viewed directly or with improper optical instruments. Avoid direct exposure to beam.***



### CAUTION

***Use a static ground wrist strap whenever handling circuit packs or working on an OLS network element to prevent electrostatic discharge (ESD) damage to sensitive components. See Electrostatic Discharge (ESD) Considerations in "Trouble Clearing Tasks" (13-1).***

## Referenced Procedures

Acceptance: [“NTP-002: Accept WaveStar® OLS 1.6T” \(10-3\)](#) refers to the following procedures:

- [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#)
- [“DLP-502: Test LEDs on Circuit Packs” \(14-7\)](#)
- [“DLP-506: Verify WaveStar® OLS 1.6T Elements Are Connected” \(14-9\)](#)
- [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#)

## Procedure

- 1 Verify that the CR/PROMPT, MJ/DEFERRED or MN LED is off at the EI circuit pack (User Panel).

**Important!** If at any point in this procedure any WaveStar® OLS 1.6T network element or system fails to respond in the indicated way, refer the trouble to installation personnel.

- 2 Connect the WaveStar® OLS 1.6T to the local OLS network element and log into the network element to be tested. For details, refer to [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#).

- 3 Verify that the OLS network elements are connected per the engineered configuration. For details, refer to [“DLP-506: Verify WaveStar® OLS 1.6T Elements Are Connected” \(14-9\)](#).

**Important!** If you are logged in to a remote network element, you will require assistance at the distant network element in order to perform [Step 4](#).

- 4 Test the LED. For details, refer to [“DLP-502: Test LEDs on Circuit Packs” \(14-7\)](#).

- 5 At the CIT, select **REPORTS - Conditions**.

- .....
- 6** Are there any alarms indicated on the report?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>NO</b>  | Continue with <a href="#">Step 7</a>                   |
| <b>YES</b> | Trouble must be referred to the installation personnel |

.....

- 7** Initiate a login to one of the other OLS network elements. For details, refer to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- .....
- 8** Repeat [Step 4](#) through [Step 7](#) for that WaveStar® OLS 1.6T NE.
- .....
- 9** Terminate the login. For details, refer to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- .....
- 10** If required, notify personnel at the remote maintenance site (Operations Support center) that the WaveStar® OLS 1.6T is ready for any operational tests.
- .....
- 11** The OLS has passed this acceptance test and is now ready to provide service.

END OF STEPS

.....







# 11      Circuit Order Tasks

## Overview

---

**Purpose**      The *Circuit Order Tasks* cover procedures that are used when adding or deleting work order items for an optical line, an OC-48/STM-16 channel, or an OC-192 channel to an in-service WaveStar® OLS 1.6T. Refer to [Table 11-1, “Circuit Order Task Index” \(11-2\)](#) for a list of all Circuit Order Tasks.

**Contents**

|                                                                                    |                      |
|------------------------------------------------------------------------------------|----------------------|
| <a href="#">IXL-001: Circuit Order Task Index</a>                                  | <a href="#">11-2</a> |
| <a href="#">NTP-002: Add Optical Channel to In-Service WaveStar® OLS 1.6T</a>      | <a href="#">11-3</a> |
| <a href="#">NTP-006: Delete Optical Channel from In-Service WaveStar® OLS 1.6T</a> | <a href="#">11-9</a> |



## IXL-001: Circuit Order Task Index

---

**Circuit Order Tasks**    [Table 11-1, “Circuit Order Task Index” \(11-2\)](#) lists the Circuit Order Tasks.

**Table 11-1    Circuit Order Task Index**

| Task Description                                                                    | Procedure                                                                                   |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Add Optical Channel to In-Service WaveStar OLS 1.6T User/Service Manual (U/SM)      | <a href="#">“NTP-002: Add Optical Channel to In-Service WaveStar® OLS 1.6T” (11-3)</a>      |
| Delete Optical Channel from In-Service WaveStar OLS 1.6T User/Service Manual (U/SM) | <a href="#">“NTP-006: Delete Optical Channel from In-Service WaveStar® OLS 1.6T” (11-9)</a> |





## NTP-002: Add Optical Channel to In-Service WaveStar® OLS 1.6T

---

This procedure provides a list of actions required to add an optical channel to an in-service OLS. Work functions are first completed at the transmit end of the channel, then continues at the receive end.

Refer to the *WaveStar® OLS 1.6T Installation Guide* (365-575-717R6.2) and office records to identify pre-installed and labeled fibers in the bay that connect to various circuit pack slots.

### Required Test Equipment

The following test equipment is required:

- Craft Interface Terminal (CIT)
- Wrist Strap

### Referenced Procedures

This procedure makes references to the following procedures.

- [“TAP-100: Technical Assistance” \(13-6\)](#)
- [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#)
- [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#)
- [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#)
- [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#)

- [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#)
- [“DLP-528: LBO Application” \(14-59\)](#)



### CAUTION

*If you are using the CIT in cut-through mode, in order to prevent a transmission interruption be aware of the following: Before any associations are entered, ensure that the related ODU is plugged into the correct slot.*



### CAUTION

*During initial software installation and when circuit packs are inserted into a running system, there will be an automatic upgrade of the firmware on the circuit packs to the latest version. Flashing green LEDs on the circuit pack faceplates will indicate that the upgrade is occurring (typically less than 30 seconds). Please DO NOT remove the circuit pack during this upgrade because it may cause damage to the affected pack. After the pack LEDs stop flashing it is then safe to remove the packs or power down the system as needed.*



### CAUTION

*Use a static ground wrist strap whenever handling circuit packs or working on an Optical Line System (OLS) end terminal to prevent electrostatic discharge (ESD) damage to sensitive components. See “Electrostatic Discharge (ESD) Considerations” (13-3) in “TAP-100: Technical Assistance” (13-3).*

**Procedure**                      **Important! DO THE STEPS BELOW IN THE ORDER LISTED**

- 1 Obtain the circuit order instructions to add an optical channel.
- 2 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- 3 Connect the craft interface terminal (CIT) and log in. For details, refer to [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#).

END OF STEPS

**At Transmit End of Channel**

- 1 Initiate a login to each of the remaining network elements. For details, refer to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- 2 At the CIT, select **REPORTS- Conditions** to obtain a report for each of the network elements.
- 3 Are there any alarm conditions listed in the reports?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>NO</b>  | Continue with Step 4.                                                                     |
| <b>YES</b> | Proceed to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> |

- 4 Are the Optical Channel being added a through channel at a WAD NE?

| IF... | THEN...                |
|-------|------------------------|
| NO    | Continue with Step 5.  |
| YES   | Continue with Step 10. |

- .....
- 5 Identify the bay, shelf and slot for the OTU assigned by the circuit order.
- .....

- 6 Remove the appropriate shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 7 Is the correct type OTU currently installed in the assigned slot?

| IF... | THEN...                                 |
|-------|-----------------------------------------|
| NO    | Continue with <a href="#">Step 8</a> .  |
| YES   | Continue with <a href="#">Step 11</a> . |

- .....
- 8 Remove the apparatus blank or incorrect type OTU from the assigned slot. For details, refer to [“DLP-509: Install/Remove Apparatus Blank” \(14-11\)](#) or to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 9 Retrieve all associations defined for the assigned slot(s). Delete all invalid associations.
- .....

- 10 Install the correct type OTU into the assigned slot. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 11 At the CIT, select **CONFIGURATION-Circuit Connection Wizard** and use the Wizard to add the required associations related to the Optical Channel. For details, refer to Chapter 4, Provisioning (4-1).
- .....

- 12 Install the proper LBO into the OTU (OUT ()) port. For details, refer to [“DLP-528: LBO Application” \(14-59\)](#).

- .....
- 13** Is the Optical Channel being added a through channel at a WAD NE?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>NO</b>  | Continue with Step 13                                  |
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

- .....
- 14** Install the proper LBO into the OTU IN (1/2) port. For details, refer to [“DLP-524: Connect Optical Power Meter for Measurement at OTU \(\) IN \(\) Port” \(14-51\)](#).

.....

END OF STEPS

.....

#### At Receive End of Channel

**Important!** You will need assistance at the receive end or travel to that location.

- .....
- 1** Identify the bay, shelf and slot for this Optical Channel assigned by the circuit order.
- .....
- 2** Remove the appropriate shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#)
- .....
- 3** Remove the protector cap and clean the ODU OUT () port on the ODU for the channel being placed in service. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 4** Is the correct type OTU currently installed in the assigned slot?

| IF...      | THEN...                                |
|------------|----------------------------------------|
| <b>NO</b>  | Continue with <a href="#">Step 5</a> . |
| <b>YES</b> | Go to Step 7.                          |

- 5 Remove the apparatus blank or incorrect type OTU from the assigned slot. For details, refer to [“DLP-509: Install/Remove Apparatus Blank” \(14-11\)](#) or to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 6 Install the correct type OTU in the assigned slot. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 7 At the CIT, select **CONFIGURATION-Circuit Connection Wizard** and use the Wizard to add the required associations related to the new circuit pack. For details on circuit provisioning, refer to Chapter 4, Provisioning (4-1).
- 8 Install the proper LBO into the OTU IN (1/2) port. For details, refer to [“DLP-524: Connect Optical Power Meter for Measurement at OTU \(\) IN \(\) Port” \(14-51\)](#).
- 9 For the through OTU, install the proper LBO into the OTU (OUT( )) port. For details, refer to [“DLP-528: LBO Application” \(14-59\)](#).
- 10 Clean and connect fiber jumpers into the OTU LBO.
- 11 Baseline the added optical channel. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
- 12 Replace the shelf cover.

END OF STEPS



## NTP-006: Delete Optical Channel from In-Service WaveStar® OLS 1.6T

---

This procedure provides a list of actions required to delete an optical channel from an in-service OLS. The optical fiber jumpers are removed first for the channel being deleted, then all network elements are updated.

Refer to the *WaveStar® OLS 1.6T Installation Guide*, (365-575-717R6.2) and office records to identify installed and labeled fibers in the bay that connect to various circuit pack slots

### Required Test Equipment

The following test equipment is required:

- Craft Interface Terminal (CIT)
- Wrist Strap

### Referenced Procedures

Circuit Order: [“NTP-006: Delete Optical Channel from In-Service WaveStar® OLS 1.6T” \(11-9\)](#) refers to the following procedures:

- [“TAP-100: Technical Assistance” \(13-6\)](#)
- [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#)
- [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#)

- [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#)
- [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#)



## CAUTION

*If you are using the CIT in cut-through mode, in order to prevent a transmission interruption be aware of the following: Before removing ODU2/3 circuit packs, ensure that all associations related to that ODU is plugged have been deleted.*



## CAUTION

*Use a static ground wrist strap whenever handling circuit packs or working on an OLS end terminal to prevent electrostatic discharge damage to sensitive components. See “Electrostatic Discharge (ESD) Considerations” (13-3) in [“TAP-100: Technical Assistance” \(13-6\)](#).*



## CAUTION

*Use care in locating the optical channel, line and assigned ports to avoid possible service interruption.*

### Procedure

**Important!** PERFORM THE STEPS BELOW IN THE ORDER LISTED

- 1 Obtain the circuit order instructions to delete an assigned channel from the associated optical line.

END OF STEPS



### At the (Near) Terminal

- 1 Remove the appropriate shelf covers. All connections can be accessed from the front. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 2 Connect the CIT and log in. For details, refer to [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#).
- 3 At the CIT, select **REPORTS - Conditions** to obtain a report.
- 4 From the report, verify that there are no alarms other than those on the channel being deleted. Clear any alarms not associated with the deleted channel before proceeding.

**Important!** PERFORM THE FOLLOWING STEPS IN THE ORDER LISTED

- 5 Locate the specific optical channel to be deleted at the OMU and ODU (optical fiber pair).
- 6 Disconnect the transmit optical fiber from the OMU IN () port for the channel being deleted from service on the optical line(s) specified in the circuit order instructions.
- 7 Place protector cap over the end of the optical fiber and over the OMU IN () port.
- 8 Disconnect the optical fiber from the ODU OUT () port for the channel being deleted from service on the optical line specified in the circuit order instructions.
- 9 Place protector cap over the end of the optical fiber and over the ODU OUT ()port.

- .....
- 10** Is the Optical Channel being deleted at a through channel at a WAD NE?

| IF...      | THEN...                |
|------------|------------------------|
| <b>NO</b>  | Continue with Step 11. |
| <b>YES</b> | Continue with Step 20. |

.....

- 11** Identify the bay, shelf and slot for the OTU being disconnected by the circuit order.
- .....

- 12** Remove the appropriate shelf cover. All connections can be accessed from the front. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 13** Disconnect the optical fiber at the OTU OUT () port for the channel being deleted from service on the optical line(s) specified in the circuit order instructions.
- .....

- 14** Place protector cap over the end of the optical fiber and over the OTU OUT () port.
- .....

- 15** Disconnect the optical fiber from the OTU IN () port for the channel being deleted from service on the optical line(s) specified in the circuit order instructions.
- .....

- 16** Place protector cap over the end of the optical fiber and over the OTU IN () port.
- .....

- 17** Is the OTU to remain in the shelf?

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>NO</b>  | Continue with <a href="#">Step 18</a> . |
| <b>YES</b> | Continue with Step 20.                  |

- .....
- 18 Remove the OTU from the shelf. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).  
.....
  - 19 Install the apparatus blank into the assigned slot. For details, refer to [“DLP-509: Install/Remove Apparatus Blank” \(14-11\)](#).  
.....
  - 20 At the CIT, select **CONFIGURATION-Circuit Connection Wizard** and use the Wizard to remove the existing associations related to this Optical Channel.  
.....
- END OF STEPS  
.....

#### At the (Far) Terminal

**Important!** You may travel to the other terminal or obtain assistance at that terminal.

- .....
- 1 Repeat the steps from [“At the \(Near\) Terminal” \(11-11\)](#) at the other terminal (far terminal).  
.....
  - 2 Replace the shelf cover(s).  
.....
  - 3 Baseline the deleted optical channel. For help, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).  
.....
  - 4 The optical channel has been deleted from service.  
.....

END OF STEPS  
.....







# 12      Operations Tasks

## Overview

---

**Purpose**      This chapter provides procedures to use in daily operations. Procedures include CIT software upgrades, copying software, and initiating or terminating a login session to a remote network element. Refer to [Table 12-1, “Operations Task Index” \(12-2\)](#) for a list of all Operations Tasks.

**Contents**

|                                                                                                                     |                      |
|---------------------------------------------------------------------------------------------------------------------|----------------------|
| <a href="#">IXL-001: Operations Tasks Index</a>                                                                     | <a href="#">12-2</a> |
| <a href="#">NTP-002: Install Software (Initial Installation/ Upgrade/Change) into the CIT and a Network Element</a> | <a href="#">12-3</a> |
| <a href="#">NTP-003: Copy Software from One Network Element to Another Network Element</a>                          | <a href="#">12-5</a> |



# IXL-001: Operations Tasks Index

---

**Operations Task Index**    [Table 12-1, “Operations Task Index” \(12-2\)](#) lists the Operations Tasks.

**Table 12-1    Operations Task Index**

| <b>Task Description</b>                                                                   | <b>Procedure</b>                                                                                                                      |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Install Software (Initial Installation/Upgrade/Change) into CIT and WaveStar® OLS 1.6T NE | <a href="#">“NTP-002: Install Software (Initial Installation/Upgrade/Change) into the CIT and a Network Element” (12-3)</a>           |
| Copy Software from One WaveStar® OLS 1.6T NE to Another NE                                | <a href="#">“NTP-003: Copy Software from One Network Element to Another Network Element” (12-5)</a>                                   |
| Initiate or Terminate Login Session to a Remote NE Using WaveStar® OLS 1.6T CIT           | <a href="#">“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” (14-43)</a>              |
| Modify, Disable, Enable or Add a User Login and/or Password                               | <a href="#">“DLP-519: Modify, Disable, Enable or Add a User’s Login and/or Password” (14-45)</a>                                      |
| Handle and Package Bays, Subrack Assemblies, and Individual Circuit Packs for Transport   | <a href="#">“DLP-531: Packaging of Lucent Technologies Bays, Subrack Assemblies, and Individual Circuit Packs for Return” (14-88)</a> |



## NTP-002: Install Software (Initial Installation/Upgrade/Change) into the CIT and a Network Element

---

This procedure describes the installation process required to install software into a CIT and a WaveStar® OLS 1.6T NE.

### Required Test Equipment

The following test equipment is required:

- Craft Interface Terminal (CIT)
- Wrist Strap



### CAUTION

*During initial software installation and when circuit packs are inserted into a running system, there will be an automatic upgrade of the firmware on the circuit packs to the latest version. Flashing green LEDs on the circuit pack faceplates will indicate that the upgrade is occurring (typically less than 30 seconds). Please DO NOT remove the circuit pack during this upgrade because it may cause damage to the affected pack. After the pack LEDs stop flashing it is then safe to remove the packs or power down the system as needed.*

**Important! APSD is not available until the reboot is completed.**



### CAUTION

*When installing software, the CIT-PC software must be the same release or higher than the software currently running in the network element.*

**Important!** The WaveStar® OLS 1.6T CIT software is available exclusively on CD-ROM.

**Procedure**

**Important!** PERFORM THE STEPS BELOW IN THE ORDER LISTED

- .....
- 1 Verify that all items included in the software package have been received. Refer to the WaveStar® OLS 1.6T Software Ordering Guide.

**Important!** The WaveStar® OLS 1.6T Software Ordering Guide is the primary reference when ordering software for the WaveStar® OLS 1.6T.

- .....
- 2 Refer to the WaveStar® OLS 1.6T Software Release Description to locate the appropriate software download procedure for the software release being installed.

**Important!** Wait at least 30 seconds before attempting another download after a download cancellation.

END OF STEPS





## NTP-003: Copy Software from One Network Element to Another Network Element

---

This procedure describes the process required to copy software from one WaveStar® OLS 1.6T NE to another NE through the SUPVY Data Link residing in the supervisory signal.

### Required Test Equipment

The following test equipment is required:

- Craft Interface Terminal (CIT)
- Wrist Strap

### Referenced Procedures

Operation: [“NTP-003: Copy Software from One Network Element to Another Network Element” \(12-5\)](#) refers to the following procedures:

- [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#)
- [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#)

**Important!** APSD is not available until reboot is completed.

|                  |                                                               |
|------------------|---------------------------------------------------------------|
| <b>Procedure</b> | <b>Important! PERFORM THE STEPS BELOW IN THE ORDER LISTED</b> |
|------------------|---------------------------------------------------------------|

- 
- |          |                                                                                                                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b> | If required, connect the CIT to the local WaveStar® OLS 1.6T network element and condition it. For details, refer to <a href="#">“DLP-501: Connect and Condition Craft Interface Terminal (CIT)” (14-5)</a> . |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
- 
- |          |                                                                                                                                                                       |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2</b> | Initiate a Login Session to the local network element. For details, refer to <a href="#">“DLP-501: Connect and Condition Craft Interface Terminal (CIT)” (14-5)</a> . |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
- 
- |          |                                                                                                                                                                                         |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3</b> | Verify that there are no active alarms or status conditions by selecting <b>REPORTS- Conditions</b> . Review the report and clear any conditions before proceeding with this procedure. |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
-

- 
- 4** Refer to *WaveStar® Optical Line System (OLS) 1.6T Software Release Description* and perform the remote download procedure.

END OF STEPS

---





# 13 Trouble Clearing Tasks

## Overview

---

**Purpose** This chapter covers procedures on clearing the conditions that cause an alarm and clearing trouble reports. These procedures are consistent with the maintenance philosophy given in [“TAP-100: Technical Assistance” \(13-6\)](#).

**Important!** Before attempting any trouble clearing procedures, refer to [“TAP-100: Technical Assistance” \(13-6\)](#) for a list of all Trouble Clearing Tasks and the **correct order** in which to perform these tasks.

### Contents

|                                                                                      |                       |
|--------------------------------------------------------------------------------------|-----------------------|
| <a href="#">IXL-001: Trouble Clearing Task Index</a>                                 | <a href="#">13-5</a>  |
| <a href="#">TAP-100: Technical Assistance</a>                                        | <a href="#">13-6</a>  |
| <a href="#">TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA</a>                | <a href="#">13-8</a>  |
| <a href="#">TAP-104: Clear Trouble Report</a>                                        | <a href="#">13-17</a> |
| <a href="#">TAP-107: Address Environmental Input and/or Control Output Condition</a> | <a href="#">13-22</a> |
| <a href="#">TAP-108: Address Missing or Incorrect Response</a>                       | <a href="#">13-23</a> |
| <a href="#">TAP-110: Address Incoming Signal Failure</a>                             | <a href="#">13-26</a> |
| <a href="#">TAP-111: Clear 'Circuit Pack Failure'</a>                                | <a href="#">13-32</a> |
| <a href="#">TAP-112: Clear 'Circuit Pack Removed'</a>                                | <a href="#">13-37</a> |

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| <a href="#"><u>TAP-113: Clear 'FLASH or BOS Failure'</u></a>                                                                     | <a href="#"><u>13-42</u></a>  |
| <a href="#"><u>TAP-114: Clear Condition When 'ABN'/NE ACTY/INFO-N LED is Lit</u></a>                                             | <a href="#"><u>13-50</u></a>  |
| <a href="#"><u>TAP-117: Clear 'BACKUP:IP, CPYPGM:IP, INITSWD:IP, Restore:IP and SW-DWNLD:IP'</u></a>                             | <a href="#"><u>13-53</u></a>  |
| <a href="#"><u>TAP-119: Clear 'Circuit Breaker/Power Failure "A or B" or "A and B"'</u></a>                                      | <a href="#"><u>13-55</u></a>  |
| <a href="#"><u>TAP-121: Clear 'No CP Expected in Slot'</u></a>                                                                   | <a href="#"><u>13-61</u></a>  |
| <a href="#"><u>TAP-124: Address 'Reset in Progress'</u></a>                                                                      | <a href="#"><u>13-65</u></a>  |
| <a href="#"><u>TAP-125: Clear 'FLASH Unrecognizable Code'</u></a>                                                                | <a href="#"><u>13-67</u></a>  |
| <a href="#"><u>TAP-126: Clear 'FLASH/SYSCTL Code Mismatch'</u></a>                                                               | <a href="#"><u>13-68</u></a>  |
| <a href="#"><u>TAP-127: Clear 'Unexpected CP Type'</u></a>                                                                       | <a href="#"><u>13-72</u></a>  |
| <a href="#"><u>TAP-128: Clear Trouble In CIT (CIT Does Not Respond to Commands)</u></a>                                          | <a href="#"><u>13-77</u></a>  |
| <a href="#"><u>TAP-129: Address 'Circuit Pack Booting'</u></a>                                                                   | <a href="#"><u>13-79</u></a>  |
| <a href="#"><u>TAP-130: Restore Network Element Operation After Power Loss</u></a>                                               | <a href="#"><u>13-82</u></a>  |
| <a href="#"><u>TAP-131: Clear 'Client Synchronization Failure'</u></a>                                                           | <a href="#"><u>13-86</u></a>  |
| <a href="#"><u>TAP-132: Clear 'Topology Construction In Progress'</u></a>                                                        | <a href="#"><u>13-91</u></a>  |
| <a href="#"><u>TAP-133: Clear 'FLASH Removed'</u></a>                                                                            | <a href="#"><u>13-92</u></a>  |
| <a href="#"><u>TAP-144: Clear 'OMU/ODU warm-up in progress'</u></a>                                                              | <a href="#"><u>13-96</u></a>  |
| <a href="#"><u>TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure</u></a>                                                    | <a href="#"><u>13-97</u></a>  |
| <a href="#"><u>TAP-156: Clear 'J0 Mismatch'</u></a>                                                                              | <a href="#"><u>13-103</u></a> |
| <a href="#"><u>TAP-160: Clear 'Power "A or B" for "Fan 1 or 2" Failures'; or 'Power "A and B" for "Fan 1 or 2" Failures'</u></a> | <a href="#"><u>13-106</u></a> |
| <a href="#"><u>TAP-162: Clear 'Fan "1" or "2" or Clogged Dust Filter "1" or "2" Failure'</u></a>                                 | <a href="#"><u>13-107</u></a> |
| <a href="#"><u>TAP-166: Clear 'APSD Active-Line'</u></a>                                                                         | <a href="#"><u>13-109</u></a> |
| <a href="#"><u>TAP-167: Clear 'APSD Active-ODU'</u></a>                                                                          | <a href="#"><u>13-111</u></a> |
| <a href="#"><u>TAP-174: Clear 'Insufficient Span Loss (&lt;10 dB)'</u></a>                                                       | <a href="#"><u>13-115</u></a> |
| <a href="#"><u>TAP-177: Test LED In-Progress</u></a>                                                                             | <a href="#"><u>13-117</u></a> |

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| <a href="#"><u>TAP-178: Clear SUPVY Add Input LOS</u></a>                                                           | <a href="#"><u>13-118</u></a> |
| <a href="#"><u>TAP-179: Clear 'Topology Construction Incomplete'</u></a>                                            | <a href="#"><u>13-122</u></a> |
| <a href="#"><u>TAP-180: Clear 'WAD Drop Channel LOS'</u></a>                                                        | <a href="#"><u>13-124</u></a> |
| <a href="#"><u>TAP-181: Clear 'SUPVY Drop Output LOS'</u></a>                                                       | <a href="#"><u>13-126</u></a> |
| <a href="#"><u>TAP-182: Clear 'OW1TYPE, OW2TYPE, or OW3TYPE'</u></a>                                                | <a href="#"><u>13-129</u></a> |
| <a href="#"><u>TAP-184: Clear 'Bay Bus Failure, BC Bus Failure, OH Bus Failure'</u></a>                             | <a href="#"><u>13-130</u></a> |
| <a href="#"><u>TAP-186: Clear 'OMS (OA) LOS'</u></a>                                                                | <a href="#"><u>13-135</u></a> |
| <a href="#"><u>TAP-188: Clear 'OMS (ODU) LOS'</u></a>                                                               | <a href="#"><u>13-139</u></a> |
| <a href="#"><u>TAP-190 Clear "OMON LOS"</u></a>                                                                     | <a href="#"><u>13-143</u></a> |
| <a href="#"><u>TAP-192: Clear 'Local SUPVY DL Failure,' 'Express SUPVY DL Failure, or 'PROVDLTYPE Mismatch'</u></a> | <a href="#"><u>13-148</u></a> |
| <a href="#"><u>TAP-193: Clear 'Invalid Primary DSA Address'</u></a>                                                 | <a href="#"><u>13-152</u></a> |
| <a href="#"><u>TAP-194: Clear 'RM Unreachable'</u></a>                                                              | <a href="#"><u>13-154</u></a> |
| <a href="#"><u>TAP-195 Clear 'DSA Unreachable'</u></a>                                                              | <a href="#"><u>13-159</u></a> |
| <a href="#"><u>TAP-197: Clear 'WaveWrapper Path Trace Mismatch'</u></a>                                             | <a href="#"><u>13-162</u></a> |
| <a href="#"><u>TAP-202: Clear 'WAD Add LOS'</u></a>                                                                 | <a href="#"><u>13-165</u></a> |
| <a href="#"><u>TAP-207: Clear 'Unexpected Channel'</u></a>                                                          | <a href="#"><u>13-169</u></a> |
| <a href="#"><u>TAP-210: Clear 'Optical Channel Transmit Failure'</u></a>                                            | <a href="#"><u>13-170</u></a> |
| <a href="#"><u>TAP-211: Clear 'Clamping Transmit OA to Output O-Channel Power'</u></a>                              | <a href="#"><u>13-175</u></a> |
| <a href="#"><u>TAP-212: Clear 'DCM Failure' and/or Isolate Defective DCM Connections</u></a>                        | <a href="#"><u>13-179</u></a> |
| <a href="#"><u>TAP 213: Clear TCA Optics 'OLINE (TOPR-OL)'</u></a>                                                  | <a href="#"><u>13-185</u></a> |
| <a href="#"><u>TAP 214: Clear TCA Optics 'OLINE (TOPT-OL)'</u></a>                                                  | <a href="#"><u>13-188</u></a> |
| <a href="#"><u>TAP-215: Clear 'TCA Optics OCHAN (SPR-C)'</u></a>                                                    | <a href="#"><u>13-190</u></a> |
| <a href="#"><u>TAP-216: Clear 'TCA Optics: OCHAN (SPT-C)'</u></a>                                                   | <a href="#"><u>13-195</u></a> |
| <a href="#"><u>TAP-217: Clear 'TCA Optics: OLINE (PLE-RPx) {x=1-6}'</u></a>                                         | <a href="#"><u>13-197</u></a> |

|                                                                                                             |                        |
|-------------------------------------------------------------------------------------------------------------|------------------------|
| <a href="#">TAP-218: Clear 'TCA Optics: OLIN (PLE-TPx) {x=1-6}'</a>                                         | <a href="#">13-200</a> |
| <a href="#">TAP-219: Clear 'TCA Optics: OTU OC-48/STM-16 (OPR)'</a>                                         | <a href="#">13-203</a> |
| <a href="#">TAP-220: Clear 'TCA Optics: OTU OC-48/STM-16 (OPT)'</a>                                         | <a href="#">13-206</a> |
| <a href="#">TAP-221: Clear 'TCA Optics: OTU OC-48/STM-16 (LBC)'</a>                                         | <a href="#">13-208</a> |
| <a href="#">TAP-222: Clear 'TCA Optics: OTU OC-192/STM-64 (OPR)'</a>                                        | <a href="#">13-209</a> |
| <a href="#">TAP-223: Clear 'TCA Optics: OTU OC-192/STM-64 (OPT)'</a>                                        | <a href="#">13-212</a> |
| <a href="#">TAP-224: Clear 'TCA Optics: OTU OC-192/STM-64 (LBC)'</a>                                        | <a href="#">13-214</a> |
| <a href="#">TAP-225: Clear 'TCA Optics: OTU HSBB (OPR)'</a>                                                 | <a href="#">13-216</a> |
| <a href="#">TAP-226: Clear 'TCA Optics: OTU HSBB (OPT)'</a>                                                 | <a href="#">13-220</a> |
| <a href="#">TAP-227: Clear 'TCA Optics: OTU HSBB (LBC)'</a>                                                 | <a href="#">13-222</a> |
| <a href="#">TAP-230: Clear 'TCA Optics: SUPVY (SPR-SU)'</a>                                                 | <a href="#">13-224</a> |
| <a href="#">TAP-231: Clear 'TCA Optics: SUPVY (SPT-SU)'</a>                                                 | <a href="#">13-227</a> |
| <a href="#">TAP-232: Clear 'Incoming ORS Client LOS'</a>                                                    | <a href="#">13-230</a> |
| <a href="#">TAP-233: Clear 'Incoming ORS Line LOS'</a>                                                      | <a href="#">13-235</a> |
| <a href="#">TAP-234: Address 'Incoming LOS Signal Failure When OTU is Associated with ORS'</a>              | <a href="#">13-242</a> |
| <a href="#">TAP-235: Address 'DCM Port Loss Out of Range'</a>                                               | <a href="#">13-246</a> |
| <a href="#">TAP-236: Clear 'OCh Payload Label Mismatch'</a>                                                 | <a href="#">13-252</a> |
| <a href="#">TAP-237: Clear 'TCA Digital Alarm OTU OC48 or 192 CVS, ESS, SESS, or SEFESS (15 min/1 day)'</a> | <a href="#">13-254</a> |
| <a href="#">TAP-238: Clear 'TCA Digital Alarm OTU OC192 FEC-EC, FEC-UBC (15 min/1 day)'</a>                 | <a href="#">13-258</a> |
| <a href="#">TAP-240: Clear 'Outdated Boot Flash'</a>                                                        | <a href="#">13-261</a> |
| <a href="#">TAP-241: Clear 'DSA Registration Error'</a>                                                     | <a href="#">13-265</a> |
| <a href="#">TAP-242: Clear 'MUX OTU LMI'</a>                                                                | <a href="#">13-266</a> |
| <a href="#">TAP-243: Clear 'TCA Digital Alarm OTU STM-16 or -64 BBE, ESS, SESS, or UASS (15 min/1 day)'</a> | <a href="#">13-268</a> |



## IXL-001: Trouble Clearing Task Index

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**Task Index** Table 13-1, "Trouble Clearing Task Index" (13-2) is a list of all Trouble Clearing Tasks.

**Table 13-1 Trouble Clearing Task Index**

| Task Description                                                          | Procedure                                                                  |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Technical Assistance                                                      | "TAP-100: Technical Assistance" (13-3)                                     |
| Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA                              | "TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA" (13-5)             |
| Clear Trouble Report (of Bad Outgoing Signals From Local Network Element) | "TAP-104: Clear Trouble Report" (13-14)                                    |
| Clear Trouble in CIT (CIT Does Not Respond to Commands)                   | "TAP-128: Clear Trouble In CIT (CIT Does Not Respond to Commands)" (13-74) |
| Restore Network Element Operation After Power Loss                        | "TAP-130: Restore Network Element Operation After Power Loss" (13-79)      |



# TAP-100: Technical Assistance

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|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>                           | <p>Successful technical assistance relies on gathering system information. A local visual inspection of the equipment may be made, but most internal hardware problems are detected and corrected using the WaveStar® OLS 1.6T CIT. The WaveStar® OLS 1.6T CIT is used to obtain detailed information about the system. The WaveStar® OLS 1.6T CIT retrieves detailed reports about performance monitoring, alarms and status, and configurations for the local and remote WaveStar® OLS 1.6T NEs.</p>        |
| <b>Trouble Analysis Procedures (TAPs)</b> | <p>The Trouble Analysis Procedures (TAPs) found in this document provide detailed instructions on how-to:</p> <ul style="list-style-type: none"> <li>• Replace faulty circuit packs</li> <li>• Obtain performance reports</li> <li>• Retrieve alarm and status reports</li> </ul> <p>This information is analyzed to determine the status of the system. If a condition cannot be corrected, the technician is then directed to contact the local maintenance engineering group for technical assistance.</p> |
| <b>Technical Assistance</b>               | <p>The technician makes decisions regarding trouble analysis, corrective action, and obtaining assistance. The technician and the local technical support staff may choose to continue trouble analysis based on knowledge or experience with the WaveStar® OLS 1.6T, or they may elect to obtain assistance by calling Customer Technical Assistance Management (CTAM) 1-800 225 4672 (United States) and 1-630 224-4672 (International), in accordance with local procedures.</p>                           |
| <b>Circuit Pack Failures</b>              | <p>Circuit pack failures are identified by constantly lit LEDs and reported by network alarms and reports.</p> <p>Circuit packs are replaced in a specified sequence, but only one circuit pack is replaced at a time. If a trouble is not cleared after replacing a circuit pack, the original circuit pack should be reinstalled. This reduces the chances of returning nondefective circuit packs for repair.</p>                                                                                          |



**Electrostatic Discharge (ESD) Considerations**

Any integrated circuit on a circuit pack can be damaged by static electricity that builds up within a work area, particularly in areas with low relative humidity. This static buildup on work surfaces and on personnel and their clothing is produced by the various charging effects of even simple movements and by contact between various objects.

As a rule, the greatest potential for electrostatic damage occurs in areas with the lowest relative humidity. But, because such damage can occur anywhere, all personnel handling circuit packs must adhere to the following precautions:

1. Keep all food wrappers, plastics, and Styrofoam containers away from all circuit packs.
2. Read all warning labels on bags and cartons containing electronic components before opening.
3. If possible, open all circuit packs at a static-safe work position using properly grounded wrist straps and table mats that dissipate static electricity.
4. Whenever possible, wait to remove circuit packs from their protective antistatic packaging until time to insert them into a shelf.
5. Never touch a circuit pack's components, conductors, or connector pins. Handle all circuit packs only by the faceplate or latch, or by the top and bottom outermost edges.
6. Always wear a grounded wrist strap or wear a heel strap, and stand on a grounded, static-dissipating floor mat when handling circuit packs (storing, installing, or removing) or when working on backplanes.
7. Always store and transport circuit packs in static-safe packages. (Shielding is not required unless specified.)
8. When removing a circuit pack from the shelf, immediately put it into a static-safe package.
9. Try to keep relative humidity above 20 percent.
10. OLS network elements are equipped with grounding jacks for connecting the static ground wrist strap. The jacks are located on the user panel and on the filter panel.
11. Keep the electromagnetic interference (EMI)/ESD protective front shelf covers closed at all times. Close the cover immediately after a maintenance procedure such as replacing a circuit pack.



# TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA

**Overview** This procedure is used to clear the Prompt Maintenance Alarm (PMA) conditions listed when you click the **REPORTS- Conditions**. Clear alarm conditions in the following order: controllers(s), transmission, other.

**Procedure** **Important!** If at any time during the following procedure you observe that the PWR OUTPUT LED on the circuit breakers of the addressed shelf is not lit, proceed to [“TAP-119: Clear ‘Circuit Breaker/Power Failure “A or B” or “A and B”” \(13-55\)](#) to restore power to the shelf. Alarm condition reports (Alarm List and Condition List) automatically update with alarm status changes.

- 1 Is the CIT conditioned and connected to the WaveStar® OLS 1.6T NE?

| IF... | THEN...                                                                                                                         |
|-------|---------------------------------------------------------------------------------------------------------------------------------|
| YES   | Continue with Step 2.                                                                                                           |
| NO    | Complete <a href="#">“DLP-501: Connect and Condition Craft Interface Terminal (CIT)” (14-5)</a> , and return to this procedure. |

- 2 At the CIT, select **REPORTS - Conditions** to obtain a report of the alarms and conditions.

- 3 Record the information in the AID and the Description columns for the topmost entry in the report.

- 4 Is there an ENV - (#) or CONT - (#) in the AID column recorded in Step 3?

| IF...      | THEN...                                                                                                     |
|------------|-------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Proceed to <a href="#">“TAP-107: Address Environmental Input and/or Control Output Condition” (13-22)</a> . |
| <b>NO</b>  | Continue with Step 5.                                                                                       |

- 5 Find the Description information that was recorded in Step 3 in Table 13-2, “Trouble Condition — TAP Cross Reference” (13-9) and go to the referenced TAP.

END OF STEPS

Refer to “Trouble Condition — TAP Cross Reference” (13-6) for a list of conditions cross-referenced to their respective trouble clearing tasks.

**Table 13-2 Trouble Condition — TAP Cross Reference**

| DESCRIPTION                                         | Proceed to:                                                                                              |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| APSD active-line                                    | <a href="#">“TAP-166: Clear ‘APSD Active-Line’ ” (13-109)</a>                                            |
| APSD active-ODU                                     | <a href="#">“TAP-167: Clear ‘APSD Active-ODU’ ” (13-111)</a>                                             |
| BACKUP:IP                                           | <a href="#">“TAP-117: Clear ‘BACKUP:IP, CPYPGM:IP, INITSWD:IP, Restore:IP and SW-DWNLD:IP’ ” (13-53)</a> |
| Bay Bus Failure                                     | <a href="#">“TAP-184: Clear ‘Bay Bus Failure, BC Bus Failure, OH Bus Failure’ ” (13-130)</a>             |
| BC Bus Failure                                      | <a href="#">“TAP-184: Clear ‘Bay Bus Failure, BC Bus Failure, OH Bus Failure’ ” (13-130)</a>             |
| BOS failure                                         | <a href="#">“TAP-113: Clear ‘FLASH or BOS Failure’ ” (13-42)</a>                                         |
| BOS removed                                         | <a href="#">“TAP-112: Clear ‘Circuit Pack Removed’ ” (13-37)</a>                                         |
| Circuit breaker/power failure “A or B” or “A and B” | <a href="#">“TAP-119: Clear ‘Circuit Breaker/Power Failure “A or B” or “A and B” ” (13-55)</a>           |
| Circuit Pack Booting (Various)                      | <a href="#">“TAP-129: Address ‘Circuit Pack Booting’ ” (13-79)</a>                                       |
| Clamping Transmit OA to Output O-Channel Power      | <a href="#">“TAP-211: Clear ‘Clamping Transmit OA to Output O-Channel Power’ ” (13-175)</a>              |

**Table 13-2 Trouble Condition — TAP Cross Reference (continued)**

| DESCRIPTION                    | Proceed to:                                                                                                              |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Client Synchronization Failure | <a href="#">“TAP-131: Clear ‘Client Synchronization Failure’ ” (13-86)</a>                                               |
| Clogged Dust Filter 1          | <a href="#">“TAP-162: Clear ‘Fan “1” or “2” or Clogged Dust Filter “1”or “2” Failure’ ” (13-107)</a>                     |
| Clogged Dust Filter 2          | <a href="#">“TAP-162: Clear ‘Fan “1” or “2” or Clogged Dust Filter “1”or “2” Failure’ ” (13-107)</a>                     |
| CPYPGM:IP tid                  | <a href="#">“TAP-117: Clear ‘BACKUP:IP, CPYPGM:IP, INITSWD:IP, Restore:IP and SW-DWNLD:IP’ ” (13-53)</a>                 |
| DCM Failure                    | <a href="#">“TAP-212: Clear ‘DCM Failure’ and/or Isolate Defective DCM Connections” (13-179)</a>                         |
| DCM Port Loss Out of Range     | <a href="#">“TAP-235: Address ‘DCM Port Loss Out of Range’ ” (13-246)</a>                                                |
| DSA Registration Error         | <a href="#">“TAP-241: Clear ‘DSA Registration Error’ ” (13-265)</a>                                                      |
| DSA Unreachable                | <a href="#">“TAP-195 Clear ‘DSA Unreachable’ ” (13-159)</a>                                                              |
| EI failure                     | <a href="#">“TAP-111: Clear ‘Circuit Pack Failure’ ” (13-32)</a>                                                         |
| EI removed                     | <a href="#">“TAP-112: Clear ‘Circuit Pack Removed’ ” (13-37)</a>                                                         |
| Express SUPVY DL Failure       | <a href="#">“TAP-192: Clear ‘Local SUPVY DL Failure,’ ‘Express SUPVY DL Failure, or ‘PROVDLTYPE Mismatch’ ” (13-148)</a> |
| Fan 1 failure                  | <a href="#">“TAP-162: Clear ‘Fan “1” or “2” or Clogged Dust Filter “1”or “2” Failure’ ” (13-107)</a>                     |
| Fan 2 failure                  | <a href="#">“TAP-162: Clear ‘Fan “1” or “2” or Clogged Dust Filter “1”or “2” Failure’ ” (13-107)</a>                     |
| FLASH failure                  | <a href="#">“TAP-113: Clear ‘FLASH or BOS Failure’ ” (13-42)</a>                                                         |
| ‘FLASH Removed’                | <a href="#">“TAP-133: Clear ‘FLASH Removed’ ” (13-92)</a>                                                                |
| ‘FLASH Removal Enabled’        | <a href="#">“TAP-114: Clear Condition When ‘ABN’/NE ACTY/INFO-N LED is Lit ” (13-50)</a>                                 |
| ‘FLASH Unrecognizable Code’    | <a href="#">“TAP-125: Clear ‘FLASH Unrecognizable Code’ ” (13-67)</a>                                                    |
| ‘FLASH/SYSCTL Code Mismatch’   | <a href="#">“TAP-126: Clear ‘FLASH/SYSCTL Code Mismatch’ ” (13-68)</a>                                                   |

**Table 13-2 Trouble Condition — TAP Cross Reference (continued)**

| <b>DESCRIPTION</b>                                                    | <b>Proceed to:</b>                                                                                        |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Incoming HSBB LOL Failure                                             | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming HSBB LOS Failure                                             | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Address 'Incoming LOS Signal Failure When OTU is Associated with ORS' | <a href="#">“TAP-234: Address 'Incoming LOS Signal Failure When OTU is Associated with ORS'” (13-242)</a> |
| Incoming OCH 10G LOS Failure                                          | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming OCH 10G LOF Failure                                          | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming OC-48 LOF failure                                            | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming OC-48 LOS failure                                            | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming OC-192 LOF failure                                           | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming OC-192 LOS failure                                           | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming ORS Client LOS failure                                       | <a href="#">“TAP-232: Clear 'Incoming ORS Client LOS'” (13-230)</a>                                       |
| Incoming ORS Line LOS failure                                         | <a href="#">“TAP-233: Clear 'Incoming ORS Line LOS'” (13-235)</a>                                         |
| Incoming optical channel LOS                                          | <a href="#">“TAP-110: Address Incoming Signal Failure” (13-26)</a>                                        |
| Incoming optical line LOS                                             | <a href="#">“TAP-110: Address Incoming Signal Failure” (13-26)</a>                                        |
| Incoming STM-16 LOF failure                                           | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming STM-16 LOS failure                                           | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming STM-64 LOF failure                                           | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |
| Incoming STM-64 LOS failure                                           | <a href="#">“TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure ” (13-97)</a>                         |

**Table 13-2 Trouble Condition — TAP Cross Reference (continued)**

| DESCRIPTION                      | Proceed to:                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Incoming SUPVY channel LOF       | <a href="#">“TAP-110: Address Incoming Signal Failure” (13-26)</a>                                                      |
| Incoming SUPVY channel LOS       | <a href="#">“TAP-110: Address Incoming Signal Failure” (13-26)</a>                                                      |
| Inhibit Alarms-Office Alarms     | <a href="#">“TAP-114: Clear Condition When ‘ABN’/NE ACTY/INFO-N LED is Lit ” (13-50)</a>                                |
| INITSWD:IP                       | <a href="#">“TAP-117: Clear ‘BACKUP:IP, CPYPGM:IP, INITSWD:IP, Restore:IP and SW-DWNLD:IP’” (13-53)</a>                 |
| Insufficient span loss (<10 dB)  | <a href="#">“TAP-174: Clear ‘Insufficient Span Loss (&lt;10 dB)’ ” (13-115)</a>                                         |
| Invalid Primary DSA Address      | <a href="#">“TAP-193: Clear ‘Invalid Primary DSA Address’ ” (13-152)</a>                                                |
| J0 Mismatch                      | <a href="#">“TAP-156: Clear ‘J0 Mismatch’” (13-103)</a>                                                                 |
| Local SUPVY DL Failure           | <a href="#">“TAP-192: Clear ‘Local SUPVY DL Failure,’ ‘Express SUPVY DL Failure, or ‘PROVDLTYPE Mismatch’” (13-148)</a> |
| No CP Expected in Slot           | <a href="#">“TAP-121: Clear ‘No CP Expected in Slot’” (13-61)</a>                                                       |
| OA failure                       | <a href="#">“TAP-111: Clear ‘Circuit Pack Failure’” (13-32)</a>                                                         |
| OA removed                       | <a href="#">“TAP-112: Clear ‘Circuit Pack Removed’” (13-37)</a>                                                         |
| OCh Payload Label Mismatch       | <a href="#">“TAP-236: Clear ‘OCh Payload Label Mismatch’” (13-252)</a>                                                  |
| Optical Channel Transmit Failure | <a href="#">“TAP-210: Clear ‘Optical Channel Transmit Failure’ ” (13-170)</a>                                           |
| ODU failure                      | <a href="#">“TAP-111: Clear ‘Circuit Pack Failure’” (13-32)</a>                                                         |
| ODU removed                      | <a href="#">“TAP-112: Clear ‘Circuit Pack Removed’” (13-37)</a>                                                         |
| ODU/OMU warmup in progress       | <a href="#">“TAP-144: Clear ‘OMU/ODU warm-up in progress’” (13-96)</a>                                                  |
| OH Bus Failure                   | <a href="#">“TAP-184: Clear ‘Bay Bus Failure, BC Bus Failure, OH Bus Failure’ ” (13-130)</a>                            |
| OMON Failure                     | <a href="#">“TAP-111: Clear ‘Circuit Pack Failure’” (13-32)</a>                                                         |

**Table 13-2 Trouble Condition — TAP Cross Reference (continued)**

| DESCRIPTION                      | Proceed to:                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| OMON LOS                         | <a href="#">“TAP-190 Clear “OMON LOS” ” (13-143)</a>                                                                    |
| OMS (OA) LOS                     | <a href="#">“TAP-186: Clear ‘OMS (OA) LOS’” (13-135)</a>                                                                |
| OMS (ODU) LOS                    | <a href="#">“TAP-188: Clear ‘OMS (ODU) LOS’” (13-139)</a>                                                               |
| OMU Failure                      | <a href="#">“TAP-111: Clear ‘Circuit Pack Failure’” (13-32)</a>                                                         |
| OMU Removed                      | <a href="#">“TAP-112: Clear ‘Circuit Pack Removed’” (13-37)</a>                                                         |
| ORS Inhibit Switch               | <a href="#">“TAP-114: Clear Condition When ‘ABN’/NE ACTY/INFO-N LED is Lit ” (13-50)</a>                                |
| ORS Failure                      | <a href="#">“TAP-111: Clear ‘Circuit Pack Failure’” (13-32)</a>                                                         |
| ORS Forced Switch                | <a href="#">“TAP-114: Clear Condition When ‘ABN’/NE ACTY/INFO-N LED is Lit ” (13-50)</a>                                |
| ORS Manual Switch                | <a href="#">“TAP-114: Clear Condition When ‘ABN’/NE ACTY/INFO-N LED is Lit ” (13-50)</a>                                |
| ORS Removed                      | <a href="#">“TAP-112: Clear ‘Circuit Pack Removed’” (13-37)</a>                                                         |
| Optical Channel Transmit Failure | <a href="#">“TAP-210: Clear ‘Optical Channel Transmit Failure’ ” (13-170)</a>                                           |
| OTU Failure                      | <a href="#">“TAP-111: Clear ‘Circuit Pack Failure’” (13-32)</a>                                                         |
| OTU Removed                      | <a href="#">“TAP-112: Clear ‘Circuit Pack Removed’” (13-37)</a>                                                         |
| Outdated Boot Flash              | <a href="#">“TAP-240: Clear ‘Outdated Boot Flash’” (13-261)</a>                                                         |
| ‘OW1TYPE, OW2TYPE, or OW3TYPE’   | <a href="#">“TAP-182: Clear ‘OW1TYPE, OW2TYPE, or OW3TYPE’” (13-129)</a>                                                |
| ‘PROVDLTYPE Mismatch’            | <a href="#">“TAP-192: Clear ‘Local SUPVY DL Failure,’ ‘Express SUPVY DL Failure, or ‘PROVDLTYPE Mismatch’” (13-148)</a> |
| RESTORE:IP                       | <a href="#">“TAP-117: Clear ‘BACKUP:IP, CPYPGM:IP, INITSWD:IP, Restore:IP and SW-DWNLD:IP’” (13-53)</a>                 |
| RM Unreachalbe                   | <a href="#">“TAP-194: Clear ‘RM Unreachable’ ” (13-154)</a>                                                             |
| SW-DWNLD:IP                      | <a href="#">“TAP-117: Clear ‘BACKUP:IP, CPYPGM:IP, INITSWD:IP, Restore:IP and SW-DWNLD:IP’” (13-53)</a>                 |

**Table 13-2 Trouble Condition — TAP Cross Reference (continued)**

| DESCRIPTION                                                                    | Proceed to:                                                                                                                          |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Power 'A' for Fan '1' Failure                                                  | <a href="#">“TAP-160: Clear 'Power "A or B" for "Fan 1 or 2" Failures'; or 'Power "A and B" for "Fan 1 or 2" Failures"” (13-106)</a> |
| Power 'A' for Fan '2' Failure                                                  | <a href="#">“TAP-160: Clear 'Power "A or B" for "Fan 1 or 2" Failures'; or 'Power "A and B" for "Fan 1 or 2" Failures"” (13-106)</a> |
| Power 'B' for Fan '1' Failure                                                  | <a href="#">“TAP-160: Clear 'Power "A or B" for "Fan 1 or 2" Failures'; or 'Power "A and B" for "Fan 1 or 2" Failures"” (13-106)</a> |
| Power 'B' for Fan '2' Failure                                                  | <a href="#">“TAP-160: Clear 'Power "A or B" for "Fan 1 or 2" Failures'; or 'Power "A and B" for "Fan 1 or 2" Failures"” (13-106)</a> |
| Power 'A' and B' for Fan '1' Failure                                           | <a href="#">“TAP-160: Clear 'Power "A or B" for "Fan 1 or 2" Failures'; or 'Power "A and B" for "Fan 1 or 2" Failures"” (13-106)</a> |
| Power 'A' and B' for Fan '1' Failure                                           | <a href="#">“TAP-160: Clear 'Power "A or B" for "Fan 1 or 2" Failures'; or 'Power "A and B" for "Fan 1 or 2" Failures"” (13-106)</a> |
| Reset in progress                                                              | <a href="#">“TAP-124: Address 'Reset in Progress"” (13-65)</a>                                                                       |
| SUPVY add input LOS                                                            | <a href="#">“TAP-178: Clear SUPVY Add Input LOS ” (13-118)</a>                                                                       |
| SUPVY drop input LOS                                                           | <a href="#">“TAP-181: Clear 'SUPVY Drop Output LOS"” (13-126)</a>                                                                    |
| SUPVY failure                                                                  | <a href="#">“TAP-111: Clear 'Circuit Pack Failure"” (13-32)</a>                                                                      |
| SUPVY removed                                                                  | <a href="#">“TAP-112: Clear 'Circuit Pack Removed"” (13-37)</a>                                                                      |
| TCA Digital Alarm OTU OC-48 or OC-192, CVS, ESS, SESS or SEFESS (15 min/1 day) | <a href="#">“TAP-237: Clear 'TCA Digital Alarm OTU OC48 or 192 CVS, ESS, SESS, or SEFESS (15 min/1 day)"” (13-254)</a>               |
| TCA Digital Alarm OTU OC-192 FEC-EC, FEC-UBC (15 min/1 day)                    | <a href="#">“TAP-238: Clear 'TCA Digital Alarm OTU OC192 FEC-EC, FEC-UBC (15 min/1 day)"” (13-258)</a>                               |
| TCA Optics: OLINE (TOPR-OL)                                                    | <a href="#">“TAP 213: Clear TCA Optics 'OLINE (TOPR-OL)"” (13-185)</a>                                                               |
| TCA Optics: OLINE (TOPT-OL)                                                    | <a href="#">“TAP 214: Clear TCA Optics 'OLINE (TOPT-OL)"” (13-188)</a>                                                               |



**Table 13-2 Trouble Condition — TAP Cross Reference (continued)**

| DESCRIPTION                         | Proceed to:                                                                              |
|-------------------------------------|------------------------------------------------------------------------------------------|
| TCA Optics: OCHAN (SPR-C)           | <a href="#">“TAP-215: Clear ‘TCA Optics OCHAN (SPR-C)’” (13-190)</a>                     |
| TCA Optics: OCHAN (SPT-C)           | <a href="#">“TAP-216: Clear ‘TCA Optics: OCHAN (SPT-C)’” (13-195)</a>                    |
| TCA Optics: OLIN (PLE-RPx) {x=1-6}  | <a href="#">“TAP-217: Clear ‘TCA Optics: OLIN (PLE-RPx) {x=1-6}’” (13-197)</a>           |
| TCA Optics: OLIN (PLE-TPx) {x=1-6}  | <a href="#">“TAP-218: Clear ‘TCA Optics: OLIN (PLE-TPx) {x=1-6}’” (13-200)</a>           |
| TCA Optics: OTU OC-48/STM-16 (OPR)  | <a href="#">“TAP-219: Clear ‘TCA Optics: OTU OC-48/STM-16 (OPR)’” (13-203)</a>           |
| TCA Optics: OTU OC-48/STM-16 (OPT)  | <a href="#">“TAP-220: Clear ‘TCA Optics: OTU OC-48/STM-16 (OPT)’” (13-206)</a>           |
| TCA Optics: OTU OC-48/STM-16 (LBC)  | <a href="#">“TAP-221: Clear ‘TCA Optics: OTU OC-48/STM-16 (LBC)’” (13-208)</a>           |
| TCA Optics: OTU OC-198/STM-64 (OPR) | <a href="#">“TAP-222: Clear ‘TCA Optics: OTU OC-192/STM-64 (OPR)’” (13-209)</a>          |
| TCA Optics: OTU OC-198/STM-64 (OPT) | <a href="#">“TAP-223: Clear ‘TCA Optics: OTU OC-192/STM-64 (OPT)’” (13-212)</a>          |
| TCA Optics: OTU OC-198/STM-64 (LBC) | <a href="#">“TAP-224: Clear ‘TCA Optics: OTU OC-192/STM-64 (LBC)’” (13-214)</a>          |
| TCA Optics: OTU HSBB (OPR)          | <a href="#">“TAP-225: Clear ‘TCA Optics: OTU HSBB (OPR)’” (13-216)</a>                   |
| TCA Optics: OTU HSBB (OPT)          | <a href="#">“TAP-226: Clear ‘TCA Optics: OTU HSBB (OPT)’” (13-220)</a>                   |
| TCA Optics: OTU HSBB (LBC)          | <a href="#">“TAP-227: Clear ‘TCA Optics: OTU HSBB (LBC)’” (13-222)</a>                   |
| TCA Optics: SUPVY (SPR-SU)          | <a href="#">“TAP-230: Clear ‘TCA Optics: SUPVY (SPR-SU)’” (13-224)</a>                   |
| TCA Optics: OTU SUPVY (SPT-SU)      | <a href="#">“TAP-231: Clear ‘TCA Optics: SUPVY (SPT-SU)’” (13-227)</a>                   |
| Test Alarm in Progress              | <a href="#">“TAP-114: Clear Condition When ‘ABN’/NE ACTY/INFO-N LED is Lit ” (13-50)</a> |
| Test LED in Progress                | <a href="#">“TAP-177: Test LED In-Progress ” (13-117)</a>                                |
| Topology Construction in Progress   | <a href="#">“TAP-132: Clear ‘Topology Construction In Progress’ ” (13-91)</a>            |

**Table 13-2 Trouble Condition — TAP Cross Reference (continued)**

| DESCRIPTION                          | Proceed to:                                                                   |
|--------------------------------------|-------------------------------------------------------------------------------|
| Topology Construction Incomplete     | <a href="#">“TAP-179: Clear ‘Topology Construction Incomplete’ ” (13-122)</a> |
| Unexpected Channel                   | <a href="#">“TAP-207: Clear ‘Unexpected Channel’” (13-169)</a>                |
| Unexpected CP Type                   | <a href="#">“TAP-127: Clear ‘Unexpected CP Type’” (13-72)</a>                 |
| WAD Add LOS                          | <a href="#">“TAP-202: Clear ‘WAD Add LOS’” (13-165)</a>                       |
| WAD Drop Channel LOS                 | <a href="#">“TAP-180: Clear ‘WAD Drop Channel LOS’ ” (13-124)</a>             |
| WAD Incoming Optical Line LOS        | <a href="#">“TAP-110: Address Incoming Signal Failure” (13-26)</a>            |
| WAD Failure                          | <a href="#">“TAP-111: Clear ‘Circuit Pack Failure’” (13-32)</a>               |
| WAD Removed                          | <a href="#">“TAP-112: Clear ‘Circuit Pack Removed’” (13-37)</a>               |
| WaveWrapper Path Trace Mismatch      | <a href="#">“TAP-197: Clear ‘WaveWrapper Path Trace Mismatch’” (13-162)</a>   |
| MUX OTU Loss of Multiframe Indicator | <a href="#">“TAP-242: Clear ‘MUX OTU LMI’” (13-266)</a>                       |



## TAP-104: Clear Trouble Report

---

**Overview** This procedure is used to clear a Trouble Report that was received from a remote location. The remote location is receiving a bad signal or other condition from this network element.

### Procedure

---

- 1 Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 4. |
| <b>NO</b>  | Continue with Step 2. |

---

- 2 Test the LEDs. For details, see [“DLP-502: Test LEDs on Circuit Packs” \(14-7\)](#).
- 

- 3 Did all the LEDs light?

| IF...      | THEN...                                                                             |
|------------|-------------------------------------------------------------------------------------|
| <b>YES</b> | Then continue with Step 4.                                                          |
| <b>NO</b>  | Then go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> |

---

- 4 At the CIT, select **REPORTS - Conditions** and obtain a report.
- 

- 5 Are any alarm conditions indicated on the report?

| IF...      | THEN...                                                                              |
|------------|--------------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> |
| <b>NO</b>  | Then continue with Step 6.                                                           |

- 
- 6** Check with the Operations Support Center to determine if both the C-Band and L-Band optical channels/lines have failed. Multiple failed C-Band and L-Band optical channels/lines can be caused by a failed CLSC (C-Band, L-Band Separator Combiner) apparatus unit or incoming fiber break. The C-Band and L-Band systems could be in the same building or another building. Therefore, request the assistance of the Operations Support Center in determining if both C- and L-Band systems are having optical channels/lines failures.

| IF...      | THEN...                                                                                                                 |
|------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Treat the failure as an outside plant fiber cut and work with the Operations Center to fix the outside plant fiber cut. |
| <b>NO</b>  | Either the C-Band or L-Band optical line failed, continue with Step 7.                                                  |

---

**CAUTION**

*SERVICE AFFECTING - Step 7 could result in service interruption.*

- 7** Make a visual inspection of ALL outgoing cable(s) and connection(s) and correct any problem(s) found. For details, refer to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).
- 

- 8** Was a problem(s) found with the outgoing cable(s) or connection(s)?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 21. |
| <b>NO</b>  | Continue with Step 9.  |

**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 9 could result in service interruption.*

- 9 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA/ODU/WAD to manually switch the service line to a protection line or ensure all protection lines assigned to this OA/ODU/WAD are not being used for service.

**CAUTION**

*SERVICE AFFECTING - Step 10 could result in service interruption.*

**Important!** If changing the OA does not fix the problem, change the DCM apparatus unit associated with the OA. Refer to the section Remove/Install a DCM apparatus unit (10-39) of [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#). If there are transmission errors on multiple channels, or LOS at the DCM-IN port of an OA, refer to [“TAP-212: Clear ‘DCM Failure’ and/or Isolate Defective DCM Connections” \(13-179\)](#).

- 10 Replace the local transmit circuit pack as indicated from the Trouble Report. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 11 Contact the office that issued the Trouble Report and determine if the trouble has cleared.

| IF...      | THEN...                                         |
|------------|-------------------------------------------------|
| <b>YES</b> | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| <b>NO</b>  | Continue with Step 12.                          |

**CAUTION**

*SERVICE AFFECTING - Step 12 could result in service interruption.*

- 12** Remove the replacement circuit pack (installed in Step 10) and reinstall the original circuit pack. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 

- 13** Was the reported trouble an Incoming Optical Line LOS?

| IF... | THEN...                |
|-------|------------------------|
| YES   | Continue with Step 14  |
| NO    | Continue with Step 17. |

---

**CAUTION**

*SERVICE AFFECTING - Step 14 could result in service interruption.*

- 14** Replace the local transmit CLSC apparatus unit as indicated from the Trouble Report. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 

- 15** Contact the office that issued the Trouble Report and determine if the trouble has cleared?

| IF... | THEN...                                         |
|-------|-------------------------------------------------|
| YES   | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| NO    | Continue with Step 16.                          |

- .....
- 16** Remove the replacement CLSC apparatus unit (installed in Step 14) and reinstall the original CLSC apparatus unit. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 17** Return a NO TROUBLE FOUND conclusion to the report (no active local alarms or visual problems).
- .....

**CAUTION**

*SERVICE AFFECTING - Step 18 could result in service interruption.*

- 18** Optical fibers can be tested by using optical time domain reflectometers (OTDR) to help locate a fiber bend or cut. Refer to local operating procedures for further guidance in addressing this condition.
- .....
- 19** Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA/ODU/WAD or CLSC apparatus unit that the Optical Line can now be returned to service.
- .....
- 20** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***
- .....
- 21** Contact office that issued the Trouble Report and notify them that a cable problem was found and corrected.
- .....
- 22** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***

END OF STEPS

.....



# TAP-107: Address Environmental Input and/or Control Output Condition

**Overview** If either the Environmental Input or the Control Output condition appears in the **REPORTS- Conditions** report, it indicates that the condition is active. These conditions are provisioned by the customer (user enters the text string).

## Procedure

- 1 Which condition are you to address?

| IF...                | THEN...               |
|----------------------|-----------------------|
| <i>environmental</i> | Continue with Step 2. |
| <i>control</i>       | Continue with Step 4. |

**Important!** The environmental condition is external to the WaveStar® OLS 1.6T system NE.

- 2 Consult and follow the local maintenance procedures to clear the indicated environmental condition.

- 3 ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***

**Important!** The control condition is external to the WaveStar® OLS 1.6T system NE and can be (if required) released by a manual command at the CIT (refer to [“TAP-114: Clear Condition When 'ABN'/NE ACTY/INFO-N LED is Lit” \(13-50\)](#)).

- 4 Consult and follow the local maintenance procedures to clear the indicated control condition.

END OF STEPS





## TAP-108: Address Missing or Incorrect Response

**Overview** You were sent here from another procedure because a WaveStar® OLS 1.6T NE responded in an unexpected manner. This unexpected response was a missing or incorrect LED indication or CIT message.

**Procedure** **Important!** There is no LED on the DCM apparatus unit.

- 1 Was the unexpected response from a LED or from the CIT?

| IF...               | THEN...               |
|---------------------|-----------------------|
| From a <b>LED</b>   | Continue with Step 2. |
| From the <b>CIT</b> | Continue with Step 8. |

- 2 Test the LEDs. For details, see [“DLP-502: Test LEDs on Circuit Packs” \(14-7\)](#).

- 3 Did the LED(s) of interest operate as indicated above?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 4.  |
| <b>NO</b>  | Continue with Step 12. |

- 4 Is the same unexpected response still observed?

| IF...      | THEN...                                         |
|------------|-------------------------------------------------|
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| <b>YES</b> | Continue with Step 5.                           |

- 5 Return to the procedure that sent you here. If the same unexpected response is observed again, contact the appropriate maintenance support organization for further technical assistance.

- 6 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

- 7 Was the message “Reset bin fails” returned?

| IF...      | THEN...                                                                                              |
|------------|------------------------------------------------------------------------------------------------------|
| <b>YES</b> | An Invalid Access Identifier was entered. Enter a command that is compatible with the addressed AID. |
| <b>NO</b>  | Continue with Step 8.                                                                                |

**Important!** Prior to rebooting, the customer specific values should be retrieved and printed. After the reboot, re-provision the non-defaulted values.

- 8 At the CIT, select **FAULT-Reset** and in the Reset Dialog box select **System** and click the **OK** button to reset the network element, or press the **Restart** button on the EI circuit pack (User Panel).



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

**Important!** The CIT will disconnect from the network element when the system is being reset.

- 9 Wait for the reset to complete, depending on the system size reset time varies between 30 to 60 minutes. During this time the lighting of various LEDs will be observed.
- 10 Return to the procedure that sent you here. If the same unexpected response is observed again, contact the appropriate maintenance support organization for further technical assistance.
- 11 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

**Important!** When clearing a DCM Failure alarm condition, the DCM apparatus unit has no LED. If the cause of the DCM

Failure alarm condition is a bad DCM fiber jumper, bad LBO, or failed DCM apparatus unit for the DCM IN/OUT port of an OA, then the fault LED of the OA associated with the DCM failure will flash. The NE Alarm List AID column will identify the OA and the DCM IN port. If there are transmission errors on multiple channels, or LOS at the DCM-IN port of an OA, refer to [“TAP-212: Clear ‘DCM Failure’ and/or Isolate Defective DCM Connections” \(13-179\)](#).

---



### CAUTION

*SERVICE AFFECTING - Step 12 could result in service interruption.*

- 12** Replace the circuit pack containing the LED(s) that did not respond as indicated in Step 3. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 13** Return to the procedure that sent you here. If the same unexpected response is observed again, contact the appropriate maintenance support organization for further technical assistance.

END OF STEPS

---



## TAP-110: Address Incoming Signal Failure

---

**Overview** This procedure is used when one of the following incoming signal failures is detected:

Incoming optical channel LOS  
 Incoming SUPVY channel LOF  
 Incoming SUPVY channel LOS  
 Incoming optical line LOS  
 WAD Incoming optical line LOS

### Procedure

---

**Important!** Multiple failed optical channels could be caused by a failed DCM. If replacing an OA or receive a multiple optical channel failure; replace the DCM. If there are transmission errors on multiple channels, or LOS at the DCM-IN port of an OA, refer to [“TAP-212: Clear 'DCM Failure' and/or Isolate Defective DCM Connections” \(13-179\)](#).

- 1 Refer to the **REPORTS- Conditions** and the Description column to determine the type of incoming signal failure.
- 

**Important!** If the failure shows Incoming Optical Line LOS, verify that APSD is active on that line by selecting **REPORTS- Conditions**.

- 2 Remove the appropriate shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- 

- 3 Is the failed condition an incoming SUPVY Channel LOS?

| IF... | THEN...               |
|-------|-----------------------|
| NO    | Continue with Step 4. |

| IF...      | THEN...                                                                                                                                                                                                                                                                    |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 7 (if SUPVY).<br><br><b>Important!</b> Multiple failed C-Band and L-Band optical channels/lines can be caused by a failed CLSC apparatus unit or incoming fiber break. The C-Band and L-Band systems could be in the same building or another building. |

- 
- 4 Check office records, the Operations Support Center, or consult the appropriate maintenance support organization for technical assistance to determine the L-band system connected to the CLSC apparatus unit
- 
- 5 Request the assistance of the Operations Support Center in determining if both C- and L-Band systems are having optical channels/lines failures.
- 
- 6 Are both the C-Band and L-Band optical channels/lines have failed.

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Treat the failure as a fiber cut and work with the Operations Center to fix the fiber cut. |
| <b>NO</b>  | Either the C-Band or L-Band optical channel/line failed) continue with Step 7.             |

**CAUTION**

*SERVICE AFFECTING - Step 7 could result in service interruption.*

- 7 Visually inspect the incoming signal cable(s) and connection(s) and correct any problems found. For details, refer to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).

- 8 Did the visual inspection result in correcting any problems?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 29. |
| <b>NO</b>  | Continue with Step 9.  |

- 9 Initiate a trouble report to the next upstream Network Element and have them check for alarm conditions (SUPVY circuit pack failure or SUPVY ADD Input LOS. Are there any alarm conditions at the upstream node?

| IF...      | THEN...                                                                              |
|------------|--------------------------------------------------------------------------------------|
| <b>YES</b> | Refer the trouble report to that office.<br>STOP! YOU HAVE COMPLETED THIS PROCEDURE. |
| <b>NO</b>  | Continue with Step 10.                                                               |

- 10 Using the AID and Description columns from the report in Step 1, identify the circuit pack (use the line identifier, for example, Line 1E) associated with this incoming failure condition.

**Important!** The circuit pack identified in the AID column can be located in *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), Bay Configurations.

- 11 Was an OA/ODU/WAD circuit pack associated with the incoming failure?

| IF...      | THEN...                           |
|------------|-----------------------------------|
| <b>NO</b>  | Continue with Step 13 (if SUPVY). |
| <b>YES</b> | Continue with Step 12.            |

**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 12 could result in service interruption.*

- 12** Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA/ODU/WAD to manually switch the service line to a protection line or ensure all protection lines assigned to this OA/ODU/WAD are not being used for service.

**Important!** If replacing a SUPVY circuit pack, or a reboot is in progress, do not pull the circuit pack until the reboot has successfully completed.

- 13** Replace the receive circuit pack identified in Step 10. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 14** Obtain another report (refer to Step 1). Is the same incoming signal failure still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 16. |
| <b>NO</b>  | Continue with Step 15. |

- 15** Did you replace an OA/ODU/WAD circuit pack in Step 13?

| IF...      | THEN...                           |
|------------|-----------------------------------|
| <b>NO</b>  | Continue with Step 29 (if SUPVY). |
| <b>YES</b> | Continue with Step 27.            |

- 16** Remove the replacement circuit pack (installed in Step 13) and reinstall the original circuit pack. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- .....
- 17** Identify the Line/Port (for example, Line-1E or Line-1W or 1IN or 2IN) associated with this incoming failure condition. Record the Line/Port identified in the AID column on the NE Alarm List report obtained in Step 14.
- .....
- 18** At the CIT, select **VIEW-OLS Topology-Ring Map** command to obtain a report.
- .....
- 19** In the NODE TID column locate the TID that has the incoming signal failure.
- .....
- 20** Reading across the report on the line for the TID identified in Step 19 and locate in the East or West Port column the port that corresponds to the Line/Port identified in Step 17. For example if Line-1E appears as the failed line AID column in Step 17 then look for 1E in the East column of the report. If a Port was identified in Step 17 then 1IN corresponds to the ()E port and 2 IN corresponds to the () W port in the East or West Port column on the report.
- .....
- 21** The neighbor listed in the adjacent column to the right is the source of the incoming signal.
- .....
- 22** Initiate a Trouble Report to the source of the failed incoming signal indicating the type of failure. If the source of the failed incoming signal returns a Trouble Report indicating "no trouble found," continue with Step 23.
- .....
- 23** Was the reported trouble an incoming optical line LOS?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 24. |
| <b>NO</b>  | Continue with Step 29. |



- .....
- 24** Replace the local CLSC apparatus unit. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 25** Obtain another report (refer to Step 1). Is the same incoming signal failure still listed?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Contact the appropriate maintenance support organization for further technical assistance. |
| <b>NO</b>  | Continue with Step 27.                                                                     |

- .....
- 26** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***
- .....

- 27** Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA/ODU/WAD or CLSC apparatus unit that the Optical Line can now be returned to service.
- .....

- 28** Baseline the replaced OA or SUPVY circuit pack. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
- .....

- 29** Reinstall the shelf cover. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

END OF STEPS

.....



# TAP-111: Clear 'Circuit Pack Failure'

---

**Overview** This procedure is used to replace a circuit pack with a lighted FAULT LED in response to one of these indicated failures:

EI failure (can only be seen from a remote CIT or Operations Center)

OA failure

ODU failure

OMON failure

OMU failure

ORS failure

OTU failure

SUPVY failure

WAD failure



## CAUTION

*During initial software installation and when circuit packs are inserted into a running system, there will be an automatic upgrade of the firmware on the circuit packs to the latest version. Flashing green LEDs on the circuit pack faceplates will indicate that the upgrade is occurring (typically less than 30 seconds). Please DO NOT remove the circuit pack during this upgrade because it may cause damage to the affected pack. After the pack LEDs stop flashing it is then safe to remove the packs or power down the system as needed.*

**Important!** Refer to the WaveStar® OLS 1.6T (400G/800G) Installation Manual, Release 6.2, for information on how to fiber new 4:1 OMON circuit packs (OMON1B).

## Procedure

---

**Important!** If applicable, suggest replacing the LBO if the trouble condition remains after performance power checks and replacement of the circuit pack (that has the LBO) failed to

correct the problem. For details, refer to [“DLP-528: LBO Application” \(14-59\)](#).

- 1 At the CIT, select **REPORTS- Conditions** to obtain a report.  
.....
- 2 Using the AID column from the report (Step 1), identify the appropriate shelf associated with the Circuit Pack Failure alarm condition.  
.....
- 3 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).  
.....
- 4 Is the FAULT LED lighted on the circuit pack identified in the AID column?

| IF...      | THEN...                                                                             |
|------------|-------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 5.                                                               |
| <b>NO</b>  | Refer to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |

- 5 Is the circuit pack to be replaced a OA/OTU/OMU/ODU/ORS/WAD circuit pack?

| IF...      | THEN...                                            |
|------------|----------------------------------------------------|
| <b>YES</b> | Then continue with Step 6.                         |
| <b>NO</b>  | Then continue with Step 7 (if EI, OMON, or SUPVY). |



## CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 6 could result in service interruption.*

- 6 Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this circuit pack; (1)

to manually switch the service line or channel to a protection line, and (2) to ensure that all protection lines or channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.

**Important!** A series number **S1:2** is the same series number as **S1:4**. The 2 and 4 refer to minor changes within series 1.

---



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 7 Obtain a replacement circuit pack with the same or a higher series number and install it in place of the circuit pack with the lighted FAULT LED. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

**Important!** If replacing a SUPVY circuit pack, and a reboot is in progress do not pull the circuit pack until the reboot has successfully completed.

---



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 8 Wait for the time indicated in Table 13-3, “Waiting Times” (13-38). These are the worst-case times; the alarm may clear sooner.

**Important!** Replacing the EI circuit pack in either an End Terminal, or Repeater will cause the system controller to reboot. Reseating the EI circuit pack in the Repeater will also cause the System Controller to reboot. After replacing an EI circuit pack, the SYStem IDentifier (SYSID) in the Network Service Access Point (NSAP) address will change. The local craft technician should retrieve the new SYSID from the network element (for

---

example, Repeater) by selecting the **CONFIGURATION-Installation Provision Wizard** to obtain the Provisioning Wizard. Then click the next button until the NSAP Address Information window appears and inform the SNMS technician of the new SYSID indicated in that window. After replacement or reseating of the EI circuit pack, verify that the system clock is correct. If necessary, reset the system clock.

- 9 Is the FAULT LED lighted on the replacement circuit pack?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |
| <b>NO</b>  | Continue with Step 10.                                                           |

- 10 Is the circuit pack just replaced an OA/OTU/OMU/ODU/ORS/WAD circuit pack?

| IF...      | THEN...                                         |
|------------|-------------------------------------------------|
| <b>YES</b> | Continue with Step 11.                          |
| <b>NO</b>  | Continue with Step 12 (for EI, OMON, or SUPVY). |

- 11 Notify the person that is responsible for all affected service protection signals assigned to this OA/OTU/OMU/ODU/ORS/WAD that this Optical Line can now be returned to service.

- 12 Reinstall the shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 13 Did you replace an OA, OMON or SUPVY pack?

| IF...      | THEN...                                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Baseline the replaced circuit pack. For details, refer to <a href="#">“DLP-529: Baseline Optical Parameters ” (14-74)</a> . |

| IF...     | THEN...                |
|-----------|------------------------|
| <b>NO</b> | Continue with Step 14. |

- 14** Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack/User Panel?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                    |

END OF STEPS

**Table 13-3 Waiting Times**

| CP Inserted | Waiting Time  |
|-------------|---------------|
| EI          | 15-60 minutes |
| OA          | 5 minutes     |
| ODU         | 15 minutes    |
| OMON        | 3 minutes     |
| OMU         | 15 minutes    |
| ORS         | 3 minutes     |
| OTU         | 10 minutes    |
| SUPVY       | 10 minutes    |
| WAD         | 1 minute      |



## TAP-112: Clear 'Circuit Pack Removed'

---

**Overview** Use this procedure to clear one of the conditions below by (1) installing the missing circuit pack or (2) updating the network element data base to reflect the current equipage:

EI removed (can only be seen from a remote CIT or operations center)

OA removed

ODU removed

OMU removed

OMON removed

ORS removed

OTU removed

BOS removed

SUPVY removed

WAD removed

### Procedure

---

- 1** At the CIT, select **REPORTS- Conditions** to obtain a report.  
.....
- 2** Using the AID column from the report (Step 1), identify the appropriate shelf associated with the removed circuit pack.  
.....
- 3** Remove the appropriate shelf cover. All connections can be accessed from the front. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).  
.....
- 4** Is the indicated slot empty or circuit pack unseated?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 5.                                                            |
| <b>NO</b>  | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |

- 5 Do the office records show that the slot should contain a circuit pack?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 10. |
| <b>NO</b>  | Continue with Step 6.  |

- 6 At the CIT, select **CONFIGURATION-Circuit Connection Wizard** and use the Circuit Connection Wizard to remove all associations related to the removed circuit pack. For help, refer to "Provisioning Guidelines" (4-8).

- 7 At the CIT, select **REPORTS - Conditions** to obtain a report.

- 8 Is the alarm condition cleared?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 17.                                                           |
| <b>NO</b>  | Go to <a href="#">"TAP-108: Address Missing or Incorrect Response" (13-23)</a> . |

- 9 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

- 10 Is the circuit pack to be replaced or reseated an OA/OTU/ORS/OMU/ODU/WAD circuit pack?

| IF...      | THEN...                                             |
|------------|-----------------------------------------------------|
| <b>YES</b> | Continue with Step 11.                              |
| <b>NO</b>  | Continue with Step 12 (if EI, OMON, BOS, or SUPVY). |



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 11 could result in service interruption.*

- 11** Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this circuit pack; (1) to manually switch the service line or channel to a protection line, and (2) to ensure that all protection lines or channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.

**Important!** A series number **S1:2** is the same series number as **S1:4**. The 2 and 4 refer to minor changes within series 1.

---

**Important!** If replacing a SUPVY circuit pack, and a reboot is in progress do not pull the circuit pack until the reboot has successfully completed.

- 12** Reseat the circuit pack or obtain a replacement circuit pack with the same or a higher series number and install it in the empty slot. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

**WARNING**

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 13** Wait for the time indicated in Table 13-4, “Waiting Times” (13-43). These times are best-guess times; the alarm may clear sooner.

**Important!** Replacing the EI circuit pack in either an End Terminal, or Repeater will cause the system controller to reboot. Reseating the EI circuit pack in the Repeater will also cause the System Controller to reboot. After replacing an EI circuit pack,

the SYStem IDentifier (SYSID) in the Network Service Access Point (NSAP) address will change; the local craft technician should retrieve the new SYSID from the network element, for example, Repeater, by clicking on Configuration and Installation Provisioning, and go to the second NSAP Address Information window using the CIT, and inform the SNMS technicians. After replacement or reseating of the EI circuit pack, verify that the system clock is correct. If necessary, reset the system clock.

- 14 Is the FAULT LED lighted on the replacement circuit pack?

| IF...      | THEN...                                                                                |
|------------|----------------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | Continue with Step 15.                                                                 |

- 15 Is the circuit pack just replaced an OA/OTU/ORS/OMU/ODU/WAD circuit pack?

| IF...      | THEN...                                              |
|------------|------------------------------------------------------|
| <b>YES</b> | Continue with Step 16.                               |
| <b>NO</b>  | Continue with Step 17 (for EI, OMON, BOS, or SUPVY). |

- 16 Notify the person that is responsible for all affected service or protection signals assigned to this OA that this optical line or channel can now be returned to service.

- 17 Reinstall the shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 18 Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack/User Panel?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                    |

END OF STEPS .....

**Table 13-4 Waiting Times**

| CP Inserted | Waiting Time (minutes) |
|-------------|------------------------|
| BOS         | 15-60                  |
| EI          | 15-60                  |
| OA          | 5                      |
| ODU         | 15                     |
| OMON        | 3                      |
| OMU         | 15                     |
| ORS         | 3                      |
| OTU         | 10                     |
| SUPVY       | 10                     |
| WAD         | 1                      |



## TAP-113: Clear 'FLASH or BOS Failure'

---

**Overview** This procedure explains how to clear FLASH or BOS failures.

**Procedure**      **Important!** The installation of a replacement FLASH Memory Module in the SYSMEM slot of the BOS-SYSCTL circuit pack may generate certain unexpected alarm conditions until the new software loads. Ignore these indications until the software loads.

---

- 1 At the CIT, select **REPORTS- Conditions** to obtain a report.

---

- 2 Using the AID column from the report in Step 1, identify the appropriate shelf associated with the FLASH or BOS failures.

---

- 3 Remove the appropriate shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

---

- 4 What type of fail condition is reported?

| IF...                              | THEN...                                        |
|------------------------------------|------------------------------------------------|
| FLASH failure,                     | Go to FLASH FAILURE (13-45).                   |
| BOS-SYSCTL failure                 | Go to BOS-SYSCTL FAILURE (13-48).              |
| BOS-BAYCTL or<br>BOS-OHCTL failure | Go to BOS-BAYCTL or BOS-OHCTL FAILURE (13-50). |

END OF STEPS

---

**FLASH FAILURE**

- 1 Is a replacement FLASH Memory Module with the same software release currently active on the network element available?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 2.                                                                                                                       |
| <b>NO</b>  | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |

- 2 From the NE Equipment Explorer, select the bay where the BOS () -SYSCTL (CP10) is located.
- 3 Click on the shelf where the BOS () -SYSCTL (CP10) is located.
- 4 Select the BOS () -SYSCTL (CP10) circuit pack.
- 5 From the CIT Main menu, select **CONFIGURATION-** Equipment.
- 6 Select Enable for the FMM Removal.
- 7 Click on the Apply button.
- 8 When the FAULT LED flashes, push the eject button above the SYSMEM slot of the SYSCTL circuit pack to eject the FLASH Memory Module from the SYSCTL circuit pack.

**WARNING**

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 9** Install the replacement FLASH Memory Module obtained in Step 1 into the BOS-SYSCTL SYSMEM slot. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 10** Wait approximately 5–15 min, depending on system size.

- 11** Is the red LED on the BOS () -SYSCTL (CP10) circuit pack blinking?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 13.                                                                                                                      |
| <b>NO</b>  | Consult the appropriate maintenance support organization for technical assistance before proceeding with other Trouble Clearing procedures. |

- 12** At the CIT, select **REPORTS- Conditions** to obtain another report.

- 13** Is the same alarm condition still listed under the DESCRIPTION column of the report?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |
| <b>NO</b>  | Continue with Step 14.                                                                                                                      |

- 14** Click on the bay where the BOS () -SYSCTL (CP10) is located.

- .....
- 15** Click on the shelf where the BOS () -SYSCTL (CP10) is located.
- .....
- 16** Click on the BOS () -SYSCTL (CP10) circuit pack.
- .....
- 17** At the CIT, select **CONFIGURATION-Equipment**.
- .....
- 18** Select Disable for the FMM removal.
- .....
- 19** Click on the Apply button.
- .....
- 20** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....
- 21** Is the CR/PROMPT, MJ/DEFERRED, or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Proceed to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b>                                           |

.....

END OF STEPS

.....

**BOS-SYSCTL FAILURE****CAUTION**

*The provisioning data for the Network Element is on the FLASH Memory Module that will be removed from the SYSCTL, therefore ensure that the same FLASH Memory Module removed from the SYSCTL is inserted in the new SYSCTL.*

**CAUTION**

*SERVICE AFFECTING - If this procedure is not performed properly, you can affect service.*

- 1 From the NE Equipment Explorer, click on the bay where the BOS () -SYSCTL (CP10) is located.
- 2 Click on the shelf where the BOS () -SYSCTL (CP10) is located.
- 3 Click on the BOS () -SYSCTL (CP10) circuit pack.
- 4 At the CIT, select **CONFIGURATION-Equipment**.
- 5 Select Enable for the FMM removal.
- 6 Click on the Apply button.
- 7 When the FAULT LED flashes, push the eject button above the SYSMEM slot of the SYSCTL circuit pack to eject the FLASH Memory Module from the SYSCTL circuit pack.



---

**Important!** A series number **S1:2** is the same series number as **S1:4**. The 2 and 4 refer to minor changes within series 1.

- 8** Obtain a replacement circuit pack with the same or higher series number and, **reinstall the FLASH Memory Module** removed in Step 8, into the replacement SYSCTL circuit pack.
- 



### WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 9** Install the replacement circuit pack (from Step 9) in place of the circuit pack with the lighted FAULT LED. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 
- 10** Wait approximately 15-60 min, depending on system size, or until the MJ LED is off on the EI circuit pack (User Panel), whichever comes first.
- 
- 11** At the CIT, click the **REPORTS - Conditions** to obtain a report.
- 
- 12** Is the same alarm condition still listed under the DESCRIPTION column?

| IF...      | THEN...                                                                                                                          |
|------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Consult the appropriate maintenance support organization for technical assistance before with other trouble clearing procedures. |
| <b>NO</b>  | Reinstall the shelf cover. For details, go to <a href="#">“DLP-511: Install/Remove Shelf Cover ” (14-20)</a> .                   |

- 13 Is the CR/PROMPT, MJ/DEFERRED, or MN LED lighted on the EI circuit pack (User Panel)?

| IF... | THEN...                                                                                     |
|-------|---------------------------------------------------------------------------------------------|
| YES   | Proceed to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| NO    | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b>                                             |

END OF STEPS

### BOS-BAYCTL or BOS-OHCTL FAILURE

**Important!** A series number **S1:2** is the same series number as **S1:4**. The 2 and 4 refer to minor changes within series 1.



#### CAUTION

*Do not insert a FLASH Memory Module (FMM) into the SYSMEM slot of a BOS-BAYCTL or BOS-OHCTL circuit pack. This will cause loss of service.*

- 1 Obtain a replacement circuit pack with the same or higher series number and install it in place of the circuit pack with the lighted FAULT LED. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).



#### WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 2 At the CIT, select **FAULT-Reset** and in the Reset Dialog box select **System** and click the **OK** button to reset the network element or press the Restart button on the EI circuit pack (User Panel).

- 3 Wait 15-60 min, depending on system size, or until the MJ LED is off on the EI circuit pack (User Panel), whichever comes first.

- 4 At the CIT, select **REPORTS- Conditions** to obtain a report.

- 5 Is the same alarm condition still listed under the DESCRIPTION column?

| IF...      | THEN...                                                                                                                          |
|------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Consult the appropriate maintenance support organization for technical assistance before with other trouble clearing procedures. |
| <b>NO</b>  | Continue with Step 6.                                                                                                            |

- 6 Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 7 Is the CR/PROMPT, MJ/DEFERRED, or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                                     |
|------------|---------------------------------------------------------------------------------------------|
| <b>YES</b> | Proceed to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b>                                             |

END OF STEPS



# TAP-114: Clear Condition When 'ABN'/NE ACTY/INFO-N LED is Lit

---

**Overview** This procedure is used to clear one or more of the following conditions:

- (control point string)
- disable alarms-office alarms
- Flash removal enabled
- test alarm in progress
- ORS Forced Switch
- ORS Inhibit Switch
- ORS Manual Switch

**Procedure** **Important!** The indicated condition was initiated by a user command. You must determine, by consulting with the appropriate maintenance personnel, whether the need for the user-initiated condition still exists before proceeding.

---

- 1 Does the need for the user initiated condition still exist?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 2. |
| <b>NO</b>  | Continue with Step 3. |

---

- 2 Referring to the **REPORTS- Conditions** report on the CIT screen, are any other conditions indicated?

| IF...      | THEN...                                                                                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> to clear the remaining condition(s), ignoring the condition that sent you here. |

| IF...     | THEN...                                                |
|-----------|--------------------------------------------------------|
| <b>NO</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

- .....
- 3** Use the CIT to clear the indicated condition by performing the function listed in Table 13-5, "Determine Command for Condition" (13-48).

.....  
E N D O F S T E P S  
.....

**Table 13-5 Determine Command for Condition**

| Condition to be Cleared      | Perform Function                                                                                                                                                                                                                               |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| disable alarms-office alarms | Configuration-Alarms-Alarm Configuration<br>Select the appropriate data and click the <b>OK</b> button                                                                                                                                         |
| ORS inhibit switch           | <ol style="list-style-type: none"> <li>1. At the CIT, select <b>FAULT-Protection Switch-Channel Path</b>.</li> <li>2. Select channel path with inhibit switch condition.</li> <li>3. Click the <b>Clear</b> button, then <b>OK</b>.</li> </ol> |
| ORS forced switch            | <ol style="list-style-type: none"> <li>1. At the CIT, select <b>FAULT-Protection Switch-Channel Path</b>.</li> <li>2. Select channel path with forced switch conditon.</li> <li>3. Click the <b>Clear</b> button, then <b>OK</b>.</li> </ol>   |
| ORS manual switch            | <ol style="list-style-type: none"> <li>1. At the CIT, select <b>FAULT-Protection Switch-Channel Path</b>.</li> <li>2. Select channel path with manual switch conditon.</li> <li>3. Click the <b>Clear</b> button, then <b>OK</b>.</li> </ol>   |

**Table 13-5 Determine Command for Condition (continued)**

| Condition to be Cleared | Perform Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (control point string)  | <p><b>FAULT-Operate Output Miscellaneous Discretes</b></p> <ol style="list-style-type: none"> <li>At the CIT, select <b>Fault-Operate Output Miscellaneous Discretes</b></li> <li>In the Operate Output Miscellaneous dialog box, click on the Miscellaneous Discrete control point indicated on the Condition Report description column of the TAP that sent you here.</li> <li>Check the office record to verify if the control point should be <b>ON</b> or <b>OFF</b>.</li> <li>Click the <b>OFF</b> or <b>ON</b> button to change the current setting.</li> <li>Click <b>YES</b> when the system prompts you to confirm the change.</li> <li>Observe that the Output Miscellaneous Discretes changed to the appropriate condition.</li> </ol> |
| Flash removal enabled   | <p>From the NE Equipment Explorer, select <b>Bay, Shelf, SYSCTL (CP10) circuit pack</b>. Select <b>CONFIGURATION-Equipment</b> from the Main Menu.</p> <ol style="list-style-type: none"> <li>Select the appropriate data and click the <b>Apply</b> button</li> <li>Click <b>YES</b> in the confirmation box.</li> </ol> <p>Enable and Disable FMM removal, allows for the replacement of the Flash Memory Module (FMM). This function allows the user to remove the FMM from the BOS() Circuit Pack serving the SYSCTL by pressing the FMM eject button located on the BOS() SYSCTL circuit pack. The network element reports a standing condition and flash the FAULT LED on the BOS() SYSCTL when the user function executes.</p>              |
| test alarm in progress  | Wait for the test to complete                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



## TAP-117: Clear 'BACKUP:IP, CPYPGM:IP, INITSWD:IP, Restore:IP and SW-DWNLD:IP'

---

**Overview** These alarm conditions are the result of software procedures selected by the user for backup, copy program, download, initiate and restore of software. A brief description of each of the alarm conditions is listed below:

**Important!** This is not a clearing activity; wait for the condition to finish.

### **Backup:IP**

Database backup is in progress. This function causes a transfer of the current working values in the database to the backup Flash Memory Module (FMM) database and to a specified location in a remote system.

Using the *WaveStar® Optical Line System (OLS) 1.6T Software Release Description*, (Comcode 109154401), the user will setup the destination system with the appropriate file access permissions to write data to the destination pathname location in the responder virtual file store. The pathname is assumed to point to a directory on the responder. The Backup function indicates an error if the users setup destinations are not valid.

Disregard any alarm resync message during the database backup process, as the system is only reporting a transient condition which should clear upon completion of the backup process. Note that it may take up to 30 minutes to complete this task based on delays in the customer network.

### **Cpypgm:IP (tid)**

Software is being copied from this WaveStar® OLS 1.6T NE to the NE whose target identification (TID) appears in the message.

The software download is performed in the background. Once the background download is initiated, there is no mechanism to cancel the operation. To confirm that this operation completed, check the history log for the target network element.

### **Initswd:IP (reset)**

Initiate Software (INITSWD:IP) is part of a software reset in progress. This involves downloading software from the FLASH to the BOS-SYSCTL, OHCTL, BAYCTL and board controllers on all circuit

packs. During this time, the miscellaneous discrete control points are deactivated.

### Restore:IP

Database restoration is in progress. The Network Element (NE) shall complete execution of the Restore function within two minutes of receipt, with an objective execution time of one minute. Note that it may take up to 30 minutes to complete this task based on delays in the customer network.

The restoration command shall fail for any of the following reasons:

1. If the destination pathname on the responder is not a directory.
2. If after retrieving the directory listing(s) from the Operating System (OS), the Network Element (NE) determines the number and types of files are not of the correct format for the database.
3. If the data is corrupted during transfer, found to be corrupted after transfer, invalid in any way or does not match the format used by the currently running software generic. In all of these failure cases the Network Element (FMM) copy of the database with the current contents of the backup Flash Memory Module (FMM) database.

### SW-Dwnld:IP

The software that is being downloaded is in progress. It takes about thirty minutes to complete the download. The status (IP, pass, fail) can be found in the retrieve log report.

## Procedure

- 1 If an error message appears on the screen during the backup, copy program, download, initiate and restore of the software procedure, reinitiate the desired procedure per the *WaveStar Optical Line System (OLS) 1.6T Software Release Description*.

**Important!** This is not a clearing activity; wait for the condition to finish.

END OF STEPS





## TAP-119: Clear 'Circuit Breaker/Power Failure "A or B" or "A and B"'

**Overview** This procedure is used to clear a power failure by resetting the circuit breaker on the power line filter(s) associated with the unlit **PWR OUTPUT** LED. This procedure is performed for a selected shelf by clearing the voltage supply problem at the battery distribution and fuse bay (BDFB) or by replacing a failed power filter on a shelf.

**Important!** The Power line filter A is located on the left side of each shelf and power line filter B is located on the right side of each shelf. Verify by checking the designations on the bay metal shelf cover hinge bracket, below the power filter.

**Important!** Contact the maintenance support organization before proceeding if a failure of both circuit breakers (A and B) or both feeders (A and B) to a bay exists.

### Procedure

- 1 Are any circuit breaker **PWR OUTPUT** LEDs not lit on the shelf associated with the alarm condition?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 2. |
| <b>NO</b>  | Continue with Step 4. |



### WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by an electrical power disruption.*

- 2 Reset the circuit breaker by operating the breaker to the ON position.
- 3 Did the circuit breaker remain in the ON position and the **PWR OUTPUT** LED for the circuit breaker remain on?

| IF...      | THEN...                                                                                       |
|------------|-----------------------------------------------------------------------------------------------|
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                        |
| <b>NO</b>  | Go to Step 3 of the section One Power Feeder Cable is NOT Supplying Voltage to a Bay (13-60). |

4 Are All **PWR OUTPUT** LEDs extinguished for all shelves in the bay?

| IF...      | THEN...                                                                                                                                                                                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Go to Step 6.                                                                                                                                                                                                                                                                  |
| <b>NO</b>  | Continue with Step 5.<br><br><b>Important!</b> If the EI circuit pack (User Panel) has any defective LEDs, you may not see a MJ LED.<br><a href="#">“DLP-502: Test LEDs on Circuit Packs” (14-7)</a> can be used to test the LEDs if you suspect EI circuit pack LED problems. |

5 Is the MJ LED on?

| IF...      | THEN...                                                                                        |
|------------|------------------------------------------------------------------------------------------------|
| <b>YES</b> | Go to Step 1 of the section: One Power Feeder Cable is NOT Supplying Voltage to a Bay (13-60). |
| <b>NO</b>  | Go to Step 3 of the section: One Power Feeder Cable is NOT Supplying Voltage to a Bay (13-60). |



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by an electrical power disruption.*



## CAUTION

*Consult with Technical Support personnel if you have any questions regarding the power cables.*

- 6 Both power feeder cables are NOT supplying voltage to the bay that have their PWR OUTPUT LEDs off. Check at the Battery Distribution Fuse Board (BDFB) or equivalent, visually check within the bay for loose connections, power cable problems between the BDFB and the shelf with the failure and correct the voltage supply problem.

- 
- 7 Was a problem found and corrected?

| IF...      | THEN...                                                                                         |
|------------|-------------------------------------------------------------------------------------------------|
| <b>YES</b> | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE</b>                                                  |
| <b>NO</b>  | Go to Step 11 of the section, One Power Feeder Cable is NOT Supplying Voltage to a Bay (13-60). |

END OF STEPS

---

### One Power Feeder Cable is NOT Supplying Voltage to a Bay

.....

- 1 At the CIT, select **REPORTS - Conditions** to obtain a report.  
.....
- 2 Determine from the report which power feeder cable is not providing power to the bay or the power line filter for that feeder is defective.  
.....



### CAUTION

*Step 3 through Step 5 requires an input voltage measurement at the power filter jacks of the appropriate power feeder.*

- 3 Remove the appropriate shelf cover(s) to access the power line filter. Voltage input measuring jacks (white and red) are on the front of each filter. Each shelf has two power line filters. The 48V power line filter associated with the A feeder is on located the left and the B feeder power line filter is on the right.  
.....
- 4 Measure the input voltage at the measuring jacks of the appropriate power line filter.  
.....
- 5 Does the input voltage measure between -42.75 and -60 volts?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Go to Step 8.         |
| <b>NO</b>  | Continue with Step 6. |



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by an electrical power disruption.*



## CAUTION

*Consult the Technical Support personnel if you have any questions when checking the power cables.*

- 6 Check at the Battery Distribution Fuse Board (BDFB) or equivalent, visually check within the bay for loose connections, power cable problems between the BDFB and the shelf with the failure and correct the voltage supply problem.

- 
- 7 Was a problem found and corrected?

| IF... | THEN...                                         |
|-------|-------------------------------------------------|
| YES   | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| NO    | Go to Step 11.                                  |



## CAUTION

*Steps 8, 9, and 10 require replacement of a power filter. Replacing the wrong power filter will interrupt power to the shelf providing service. The 48V power line filter associated with the A feeder is located on the left; and the B feeder power line filter is on the right. Verify the proper filter is being used by checking the rear panel designations next to the filters plug-in socket.*

- 8 Contact Technical Support personnel to notify them you are about to start replacing a power filter on a shelf.
- .....



**WARNING**

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by an electrical power disruption.*

- 9 Replace the appropriate shelf power line filter. For details, refer to ["DLP-522: Replace Power Line Filter" \(14-49\)](#).
- .....

- 10 Did the Circuit Breaker/Power "A or B" alarm condition clear?

| IF... | THEN...                |
|-------|------------------------|
| YES   | Continue with Step 12. |
| NO    | Continue with Step 11. |

.....

- 11 Consult the appropriate Technical Support organization for further technical assistance.

**Important!** The possibility exists that the system may be improperly grounded. While a ground reading of 1 Ohm or less is indicative of a good tie to ground, the ground bar to which the system is tied may be incorrect and could, therefore, allow damaging current/spikes from other equipment to adversely affect the system and the power filter. A site survey of the ground bar system is required to verify that the system is properly connected.

.....

- 12 Reinstall the appropriate shelf cover. For details, go to ["DLP-511: Install/Remove Shelf Cover" \(14-20\)](#).

END OF STEPS

.....



## TAP-121: Clear 'No CP Expected in Slot'

---

**Overview** A circuit pack was inserted in a bay slot not meant for that type of circuit pack, for example, a one or two wide circuit pack was inserted in a three wide bay slot.

**Procedure** **Important!** Some circuit packs are keyed so they will not fit in other circuit pack slot locations.

---

- 1 At the CIT, select **REPORTS- Conditions** to obtain a report.

---

- 2 Using the AID column from the report (Step 1), identify the appropriate shelf associated with the No CP expected in Slot alarm condition.

**Important!** This error message can occur when reconfiguring an existing, in-service system to another configuration, for example going from an 80-channel to a 40-channel configuration.

---

- 3 Remove the shelf cover. All connections can be accessed from the front. For details, go to "DLP-511: Install/Remove Shelf Cover" (14-19).

---

- 4 Do office records or the **WaveStar® OLS 1.6T Installation Manual** (365-575-717R6.2), Bay Configurations, show that the slot(s) should contain a circuit pack of this type? For example, an OTU in one of the three slots assigned to an OA will cause the 'No CP Expected in Slot' alarm condition.

| IF...      | THEN...                                                                                                                                                                                                                                                   |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Check office records to determine correct circuit pack or consult the appropriate maintenance support organization for technical assistance. If a circuit pack will be inserted, continue with Step 7, or <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |

| IF...     | THEN...                                             |
|-----------|-----------------------------------------------------|
| <b>NO</b> | Remove the circuit pack, then continue with Step 5. |

- 5 Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 6 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

- 7 Is the circuit pack to be replaced an OA/OTU/OMU/ODU/ORS/WAD circuit pack?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 8. |
| <b>NO</b>  | Continue with Step 9. |



## CAUTION

*SERVICE AFFECTING - Failure to follow instructions in this step could result in service interruption.*

- 8 Notify the person that is responsible for the optical line or channel associated with the service or protection signals assigned to this circuit pack to: 1) manually switch the service line to a protection line, and 2) ensure that all protection lines or optical channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.

**Important!** A series number **S1:2** is the same series number as **S1:4**. The 2 and 4 refer to minor changes within series 1.

- 9 Obtain a replacement circuit pack with the same or a higher series number and install it. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).



- 10 Wait the time indicated in Table 13-6, "Waiting Times" (13-66). These times are worst case times; alarm may clear sooner.

**Important!** Replacing the EI circuit pack in either an End Terminal, or Repeater will cause the system controller to reboot. Reseating the EI circuit pack in the Repeater will also cause the System Controller to reboot. After replacing an EI circuit pack, the SYStem IDentifier (SYSID) in the Network Service Access Point (NSAP) address will change; the local craft technician should retrieve the new SYSID from the network element, for example, Repeater, by clicking on Configuration and Installation Provisioning, and go to the second NSAP Address Information window using the CIT, and inform the SNMS technicians. After replacement or reseating of the EI circuit pack, verify that the system clock is correct. If necessary, reset the system clock.

- 11 Is the FAULT LED lighted on the replacement circuit pack?

| IF...      | THEN...                                                                               |
|------------|---------------------------------------------------------------------------------------|
| <b>YES</b> | Then go to <a href="#">"TAP-108: Address Missing or Incorrect Response" (13-23)</a> . |
| <b>NO</b>  | Then continue with Step 12.                                                           |

- 12 Is the circuit pack just replaced an OA/OTU/OMU/ODU/ORS/WAD circuit pack?

| IF...      | THEN...                                             |
|------------|-----------------------------------------------------|
| <b>YES</b> | Then continue with Step 13.                         |
| <b>NO</b>  | Then continue with Step 14 (if EI, OMON, or SUPVY). |

- 13 Notify the person that is responsible for all affected service protection signals assigned to this OA/OTU/OMU/ODU/ORS/WAD that this Optical Line can now be returned to service.

- .....
- 14** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....
- 15** Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                              |
|------------|--------------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b>                                      |

.....  
E N D O F S T E P S  
.....

**Table 13-6 Waiting Times**

| CP Inserted | Waiting Time (minutes) |
|-------------|------------------------|
| EI          | 15-60                  |
| OA          | 5                      |
| ODU         | 15                     |
| OMON        | 3                      |
| OMU         | 15                     |
| ORS         | 3                      |
| OTU         | 3                      |
| SUPVY       | 10                     |
| WAD         | 1                      |



## TAP-124: Address 'Reset in Progress'

**Overview** This procedure explains how to monitor a Reset in Progress operation and correct problems.

### Procedure

- 1 Is the MJ LED lighted?

| IF...      | THEN...                                                                        |
|------------|--------------------------------------------------------------------------------|
| <b>YES</b> | Wait 30 - 60 minutes, depending on system size, before proceeding with Step 2. |
| <b>NO</b>  | Continue with Step 5.                                                          |



### WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 2 At the CIT, initiate a login session. For details, go to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).

- 3 At the CIT, select **REPORTS- Conditions** to obtain an updated report.

- 4 Is Reset in Progress still reported?

| IF...      | THEN...                    |
|------------|----------------------------|
| <b>YES</b> | Then continue with Step 5. |
| <b>NO</b>  | Then continue with Step 8. |

- 5 Wait 10 minutes or until the MJ LED is off at the EI circuit pack/User Panel.

- 6 At the CIT, select **REPORTS- Conditions** to obtain an updated report.

- 7 Is reset in progress still reported?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |
| <b>NO</b>  | Continue with Step 8.                                                            |

- 8 Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted?

| IF...      | THEN...                                                                                |
|------------|----------------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b>                                        |

END OF STEPS



## TAP-125: Clear 'FLASH Unrecognizable Code'

---

**Overview** The software code stored in the active-partition memory of the FLASH Memory Module (FMM) is corrupted or its version is not recognized by the BOS circuit pack in the SYSCTL slot.

**Procedure** **Important!** The FLASH Unrecognizable Code **condition means that the software is bad. If the database is corrupt, it will be recognized as such and automatically backed up. (There are two copies of the database on the FMM.)**

---

- 1** At the CIT, select **VIEW-Software Release**.
- 2** Refer to the Network Element (NE) portion of the dialog box and record the software release information for the line entries, active and inactive in the partition column.
- 3** Download correct software to the FLASH memory module following the instructions provided in OPERATION:"NTP-002: Install Software (Initial Installation/Upgrade/Change) into the CIT and a Network Element" (12-3).

END OF STEPS

---



## TAP-126: Clear 'FLASH/SYSCTL Code Mismatch'

---

**Overview** The version of software code stored in the active partition on the FLASH memory module (FMM) is different from the software version in the BOS SYSCTL circuit pack. The system network element is currently functioning from the code running in the SYSCTL circuit pack.

In WaveStar® OLS 1.6T a FLASH/SYSCTL code mismatch condition may arise from either of the following two conditions: (1) The version of the software executing in memory on the SYSCTL circuit pack is different from the version of the software stored on the active partition of the FMM. This condition can only arise when the FMM is removed and another FMM with a different version of the software stored on its active partition is inserted into the BOS circuit pack acting as the SYSCTL. (2) The active partition of the FMM is corrupted.

The FLASH/SYSCTL code mismatch condition is cleared by ensuring that the versions of the software on the active partition of the FMM and software executing in memory on the SYSCTL match. The following actions may be required:

- Execute **FAULT-Reset** and click on *System*. This will cause the FMM to download code from the active FMM partition to the BOS SYSCTL circuit pack. Use this option only if the version of the software on the active FMM partition is what you intend on Upgrading/Change to next. Ensure the software on the active FMM partition is not in a corrupted state
- Perform a remote download of the required version of software from a remote network element (NE). This will copy software from another network element to the inactive FMM partition of the target NE. Then from the CIT execute **FAULT-Reset-System** and click on *System*. Use this option only if it has been determined that the software version on the active FMM partition and the software version executing in memory on the SYSCTL

circuit pack are the same. This suggests that the software on the active partition of the FMM and the BOS SYSCTL in Slot 10 has been corrupted in which case you want to replace it with a fresh copy. Typically, this means downloading a fresh copy from a remote NE or CIT-PC.

- Download the code from the CDs through the CIT to the FMM inactive partition and then execute **FAULT-Reset-System** and click on System. Use this option as an alternative to downloading software code from a remote NE.

**Procedure**

- 1 At the CIT, select **VIEW-Software Release**.
- 2 Refer to the report and record the software release information from the active line entry in the partition column. This software release is now running in the FMM and in the BOS SYSCTL in slot 10.
- 3 Refer to the report and record the software release information from the line entry inactive line entry in the partition column.
- 4 Are the software releases recorded in Step 2 and Step 3 different?

| IF...      | THEN...                                                                                                                                                      |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | A software version mismatch may be the cause. Continue with Step 5 to determine the correct software version.                                                |
| <b>NO</b>  | The software on the Active FMM Partition or in the SYSCTL in slot 10 is in a corrupted state. Continue with Step 11 to install a fresh copy of the software. |

- 5 Contact technical support to determine which of the two software releases is supposed to be running in the system network element.

- 6 Is the correct software release stored in Step 3?

| IF...      | THEN...                                                                                                      |
|------------|--------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Use this as the source for a fresh copy to be installed. Continue with Step 7 for installation instructions. |
| <b>NO</b>  | A fresh copy of the software may have to be downloaded from a remote NE or CIT-PC. Continue with Step 11.    |



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

**Important!** The CIT will disconnect from the network element when the FAULT-Reset command is executed. During the reset time, the miscellaneous discrete control points are deactivated.

- 7 At the CIT, select **FAULT-Reset-System** and click on **System**.

- 8 Wait 15-30 minutes or until the MJ LED stops flashing and is extinguished on the EI circuit pack (User Panel). Time to wait will vary depending on system size.

- 9 At the CIT, select **REPORTS- Conditions** to obtain a report.

- 10 Is the FLASH/SYSCTL Code Mismatch condition still listed?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |



| IF...     | THEN...                                  |
|-----------|------------------------------------------|
| <b>NO</b> | STOP! YOU HAVE COMPLETED THIS PROCEDURE. |

- 11 Is the correct software release running in a remote network element and is the SUPVY data link good to that network element?

| IF...      | THEN...                                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Go to OPERATION:"NTP-003: Copy Software from One Network Element to Another Network Element" (12-5) to copy software.                            |
| <b>NO</b>  | Go to OPERATION:"NTP-002: Install Software (Initial Installation/Upgrade/Change) into the CIT and a Network Element" (12-3) to install software. |

- 12 At the CIT, select **REPORTS- Conditions** to obtain a report.

- 13 Is the FLASH/SYSCTL Code Mismatch condition still listed?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |
| <b>NO</b>  | STOP! YOU HAVE COMPLETED THIS PROCEDURE.                                                                                                    |

END OF STEPS



## TAP-127: Clear 'Unexpected CP Type'

---

**Overview** The **Unexpected CP Type** condition is issued whenever the system software detects a difference between what it expects in a circuit pack (CP) slot and which CP is actually in the slot. This condition is normally cleared by correcting the difference (wrong CP type or incomplete records).

**Procedure** **Important!** Do not remove any additional circuit packs from the shelf until the **Unexpected CP Type** condition has been cleared.

---

- 1 At the CIT, select **REPORTS- Conditions** to obtain a report.

---

  - 2 Using the AID column from the report (Step 1), identify the appropriate shelf associated with the Unexpected CP Type alarm condition.

---

  - 3 From the System View double click on the appropriate shelf.

---

  - 4 Using the mouse pointer, select the circuit pack and right click to display the sub-menu.

---

  - 5 Click on **View Details**.

---

  - 6 Determine from office records the correct CP type apparatus code, the type of associations required, and wavelength (if required) for the slot in question.

---

  - 7 Compare the apparatus code on the report with the office records required apparatus code and wavelength (if required) and determine the correct CP type.

---

  - 8 If required, remove the appropriate shelf cover. All connections can be accessed from the front. For details, go to "DLP-511: Install/Remove Shelf Cover" (14-19).
-

- 9 Is the correct CP actually plugged into the slot?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 19. |
| <b>NO</b>  | Continue with Step 10. |

- 10 Is the circuit pack to be replaced an OA/OTU/OMU/ODU/ORS/WAD circuit pack?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 11. |
| <b>NO</b>  | Continue with Step 12. |



## CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 12 could result in service interruption.*

- 11 Notify the person that is responsible for the optical line or channel associated with the service or protection signals assigned to this circuit pack to: 1) manually switch the service line or channel to a protection line, and 2) ensure that all protection lines or channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 12 Obtain the correct circuit pack type as identified in Step 7 and install it in place of the circuit pack generating the **Unexpected CP Type Failure**. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 13 At the CIT, select **CONFIGURATION-Circuit Connection Wizard** and use the Wizard to add the required associations related to the new circuit pack. For details, refer to “Introduction to Provisioning” (4-2).

- 14 Wait the time indicated in Table 13-7, "Waiting Times" (13-72). These times are worst-case times; alarm may clear sooner.

**Important!** Replacing the EI circuit pack in either an End Terminal, or Repeater will cause the system controller to reboot. Reseating the EI circuit pack in the Repeater will also cause the System Controller to reboot. After replacing an EI circuit pack, the SYSID in the Network Service Access Point (NSAP) address will change; the local craft technician should retrieve the new SYSID from the network element, for example, Repeater, by clicking on Configuration - Installation Provisioning to obtain the Installation Provisioning Wizard, then go to the NSAP Address Information window using the CIT, then inform the SNMS technicians. After replacement or reseating of the EI circuit pack, verify that the system clock is correct. If necessary, reset the system clock.

- 15 Is the FAULT LED lighted on the replacement circuit pack?

| IF...      | THEN...                                                                                                           |
|------------|-------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Go to Step 20.<br><br><b>Important!</b> You can expect to see alarm messages for ODU and OMU warm-up in progress. |
| <b>NO</b>  | Continue with Step 16.                                                                                            |

- 16 Was an OA/OTU/OMU/ODU/ORS/WAD circuit pack just replaced in Step 12?

| IF...      | THEN...                                             |
|------------|-----------------------------------------------------|
| <b>YES</b> | Continue with Step 17.                              |
| <b>NO</b>  | Continue with Step 18 (if BOS, EI, OMON, or SUPVY). |

- 17 Notify the person responsible for all affected service protection signals assigned to this OA/OTU/OMU/ODU/ORS/WAD that this Optical Line can now be returned to service.

- .....
- 18** Reinstall the shelf cover. [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 19** Are all the associations related to this slot of a compatible type?

| IF...      | THEN...                                                                                                                                                                                                     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> .                                                                                                                    |
| <b>NO</b>  | Delete the incompatible associations and add the compatible associations.<br><br><b>Important!</b> If the circuit pack was just installed, wait five minutes before deleting the incompatible associations. |

.....

- 20** Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b>                                           |

.....

END OF STEPS

.....

**Table 13-7    Waiting Times**

| <b>CP Inserted</b> | <b>Waiting Time (minutes)</b> |
|--------------------|-------------------------------|
| BOS                | 15-60                         |
| EI                 | 15-60                         |
| OA                 | 5                             |
| ODU                | 15                            |
| OMON               | 3                             |
| OMU                | 15                            |
| ORS                | 3                             |
| OTU                | 10                            |
| SUPVY              | 10                            |
| WAD                | 1                             |



## TAP-128: Clear Trouble In CIT (CIT Does Not Respond to Commands)

**Overview** This procedure is used to clear trouble within the CIT such as a software hang-up or a malfunction.

### Procedure

- 1 Is the mouse operational?

| IF...      | THEN...                                                                                                                                                                                                                                                                                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Do the following:<br><ol style="list-style-type: none"> <li>1. Press the <b>CTL+ALT+DEL</b> keys. The system displays the NT/Close Program dialog box.</li> <li>2. Click <b>Task Manager</b> if running NT, <b>otherwise, continue with Step 3.</b></li> <li>3. Select <b>WaveStar CIT</b></li> <li>4. Select <b>End Task.</b></li> <li>5. Continue with Step 4.</li> </ol> |
| <b>NO</b>  | Continue with Step 2.                                                                                                                                                                                                                                                                                                                                                       |

- 2 Perform a hard boot on the PC by shutting down and then restarting the computer.

- 3 After the PC reboots is the WaveStar CIT icon on the desktop?

| IF...      | THEN...                                                                                                                                         |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 4.                                                                                                                           |
| <b>NO</b>  | Refer to the <i>WaveStar® Optical Line System (OLS) 1.6T Software Release Description</i> , ) to reload the CIT software and/or replace the PC. |

- 4 Log into the network element. For details, go to [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#).

5 Were you able to log into the NE?

| IF... | THEN...                                                                                                                                                                    |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| YES   | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b>                                                                                                                            |
| NO    | Reload the WaveStar® OLS 1.6T CIT software. For details, go to Operations: "NTP-002: Install Software (Initial Installation/Upgrade/Change) into the CIT and a NE" (12-3). |

END OF STEPS





## TAP-129: Address 'Circuit Pack Booting'

---

**Overview** This procedure explains how to address a 'Circuit Pack Booting' condition. The circuit pack can be a BOS, OA, ODU, OMON, ORS, OTU, SUPVY, or WAD circuit pack, but not an EI circuit pack. After several minutes, the circuit pack LEDs react as follows:

red FAULT LED is lit continuously

green ACTIVE LED is flashing continuously.

After the boot cycle has completed and the circuit pack has been determined to be functional, the green ACTIVE LED remains lit and the red FAULT LED goes off.

The specific conditions apply to the following circuit packs:

BOS booting (SYSCTL, BAY-OH-CTL for sysctl, bayctl, and ohctl circuit packs)

OA booting

ODU booting

OMON booting

OMU booting

ORS booting

OTU booting

SUPVY booting

WAD booting

### Procedure

---

- 1** At the CIT, select **REPORTS- Conditions** to obtain a report.  
.....
- 2** Using the AID column from the report (Step 1), identify the appropriate shelf associated with the 'Circuit Pack Booting' condition.  
.....
- 3** Remove the appropriate shelf cover. All connections can be accessed from the front. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 
- 4 Using the AID column from the report in Step 1, identify the correct circuit pack with the 'Circuit Pack Booting' condition.
- 
- 5 Wait 2–5 minutes or until the green LED starts flashing.
- 
- 6 Is the green ACTIVE LED flashing continuously and the red FAULT LED on continuously?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 8  |
| <b>NO</b>  | Continue with Step 7. |

---

- 7 Obtain another NE Alarm List report as in Step 1. Is the 'Circuit Pack Booting' condition still listed?

| IF...      | THEN...                                                                               |
|------------|---------------------------------------------------------------------------------------|
| <b>YES</b> | Proceed to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |
| <b>NO</b>  | Continue with Step 9.                                                                 |

---



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 8 Wait 5–30 minutes, depending on system size, or until the red LED goes out.
- 
- 9 Is the CR/PROMPT, MJ/DEFERRED, or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                                     |
|------------|---------------------------------------------------------------------------------------------|
| <b>YES</b> | Proceed to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                      |

E N D   O F   S T E P S



## TAP-130: Restore Network Element Operation After Power Loss

**Overview** The network element power has been restored and one or more circuit packs have an "unexpected" or "unrecognized" failure, or the System Controller did not recover.

### Procedure

- 1 Are the two green **PWR OUTPUT LEDs** lighted on all of the power filters on all of the equipped shelves?

| IF...      | THEN...                                                                                              |
|------------|------------------------------------------------------------------------------------------------------|
| <b>NO</b>  | Go to <a href="#">"TAP-119: Clear 'Circuit Breaker/Power Failure 'A or B' or 'A and B'" (13-55).</a> |
| <b>YES</b> | Continue with Step 2.                                                                                |



### WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by an electrical power disruption.*

- 2 If one or more **FAULT LEDs** are lighted during the reset process, they should be ignored during this procedure.
- 3 Wait 30–60 minutes, depending on system size, for all circuit packs to reset.
- 4 At the CIT, initiate a login session. For details, refer to ["DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT" \(14-43\).](#)
- 5 Was login successful?

| IF... | THEN...                |
|-------|------------------------|
| NO    | Continue with Step 6.  |
| YES   | Continue with Step 10. |



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by an electrical power disruption.*

- 6 Press the Restart button on the EI circuit pack.
- 
- 7 Wait 30-60 minutes, depending on system size, for all circuit packs to reset.
- 

- 8 At the CIT, initiate a login session. For details, refer to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- 

- 9 Was login successful?

| IF... | THEN...                                                                                    |
|-------|--------------------------------------------------------------------------------------------|
| NO    | Contact the appropriate maintenance support organization for further technical assistance. |
| YES   | Continue with Step 10.                                                                     |

- 
- 10 At the CIT, select **REPORTS- Conditions** to obtain a report.

**Important!** Because it is possible that a slow recovery from a power outage may result in erroneous **REPORTS- Conditions** reporting, a system reset may be necessary.

- 11 Are there any other conditions listed in the DESCRIPTION column of the report?

| IF... | THEN...                                         |
|-------|-------------------------------------------------|
| NO    | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| YES   | Continue with Step 12.                          |



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by an electrical power disruption.*

**Important!** The CIT will disconnect from the network element when the **FAULT-Reset** command is executed. Prior to rebooting, the customer specific values should be retrieved and printed. After the reboot, re-provision the non-defaulted values.

- 12 At the CIT, select **FAULT-Reset** and in the Reset Dialog box select System and click the OK button to reset the network element or press the Restart button on the EI circuit pack (User Panel).
- 13 Wait 30–60 minutes, depending on system size, or until the MJ LED is off on the EI circuit pack, whichever comes first.
- 14 At the CIT, initiate a login session. For details, refer to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- 15 At the CIT, select **REPORTS- Conditions** to obtain a report.
- 16 Are any conditions listed in the DESCRIPTION column of the report?

| IF...      | THEN...                                                                                |
|------------|----------------------------------------------------------------------------------------|
| <b>NO</b>  | Continue with Step 17 to set the system date and time.                                 |
| <b>YES</b> | Go to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |

- .....
- 17** From the NE Equipment Explorer, select WaveStar\_OLS\_400G. The word `system` is now displayed in the Enter AID field. From the Main menu, select **CONFIGURATION**.
- .....
- 18** Select **Equipment**. The system displays the calendar to the right.
- .....
- 19** Select the correct date and time settings.
- .....
- 20** Click on **Apply** and then click on **YES**.

END OF STEPS

.....



## TAP-131: Clear 'Client Synchronization Failure'

---

**Overview** The 'Client Synchronization Failure' alarm condition is issued when the system software detects an input signal from a client is out of range, or when the OTU70 circuit pack has malfunctioned, such as the clock recovery or the clock reference circuit for a specific channel in the OTU70.

**Important!** If more than one channel for the same OTU70 indicates the same failure, then the user may suspect a defective OTU70 circuit pack. The OTU70 can have up to four inputs of OC-48 signals.

### Procedure

---

- 1 At the CIT, select **REPORTS- Conditions** to obtain a report.  

---
- 2 Using the AID column from the report (Step 1), identify the appropriate shelf and slot location of the OTU with the alarm condition.  

---
- 3 Remove the shelf cover. All connections can be accessed from the front. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).  

---



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 4 could result in service interruption.*

- 4 Make a visual inspection of the incoming signal cable(s) and connections and correct any problems found. For details, refer to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).  

---
- 5 Did a visual inspection reveal any problems?



| IF...      | THEN...              |
|------------|----------------------|
| <b>YES</b> | Continue with Step 6 |
| <b>NO</b>  | Continue with Step 8 |

- 6 At the CIT, select **REPORTS- Conditions** to obtain a report.

- 7 Is the failure condition cleared?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 25 |
| <b>NO</b>  | Continue with Step 8  |



## CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 9 could result in service interruption.*

- 8 Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this circuit pack to manually switch the service line or channel to protection and to ensure that all protection lines or channels assigned to this circuit pack are not being used for service.
- 9 Make an optical power measurement on the incoming optical jumper at the OTU. For details, refer to [“DLP-524: Connect Optical Power Meter for Measurement at OTU \(\) IN \(\) Port” \(14-51\)](#).
- 10 Is the optical power measurement within limits? For details, refer to OTU Input Power Range of [“DLP-524: Connect Optical Power Meter for Measurement at OTU \(\) IN \(\) Port” \(14-51\)](#).

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 13 |

| IF... | THEN...               |
|-------|-----------------------|
| NO    | Continue with Step 11 |

11 Clean the incoming fiber jumper. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

12 Connect the incoming fiber to the correct OTU IN port.

**Important!** At this point, it appears that the local OTU is operating correctly. The trouble appears to be in the optical fiber jumper, optical line, or the client signal coming into the OTU.

13 Initiate a Trouble Report to the source of the failed incoming signal indicating the type of failure. If the source of the failed incoming signal returns a Trouble Report indicating “no trouble found,” then continue with Step 15.

14 STOP! YOU HAVE COMPLETED THIS PROCEDURE.



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 15 could result in service interruption.*

15 Remove the OTU identified in the AID column of Step 2 from the shelf. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).



### CAUTION

*The replacement OTU must have the same (or higher) circuit pack series number.*

- 16** Obtain and install the replacement OTU. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 17** Did the 'Client Synchronization Failure' condition clear?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 24 |
| <b>NO</b>  | Continue with Step 18 |

- 18** Remove the optical input jumper, reclean and reconnect it to the OTU. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- 19** Did the 'Client Synchronization Failure' condition clear?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 24 |
| <b>NO</b>  | Continue with Step 20 |

- 20** As required, check for a broken LBO, a damaged jumper, or bent or broken pins using the BERG MT370-01 pin kit for the METRAL pins. Refer to the backplane in repair/replacement procedures in the *WaveStar® OLS 1.6T Installation Manual* (365-575-717R6.2).

- 21** Reinstall the original OTU that was removed in Step 15. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 22** Connect the optical fibers to the original OTU.

- 23** Initiate a Trouble Report to the source of the failed incoming signal indicating the type of failure. If the source of the failed incoming signal returns a Trouble Report indicating “no trouble found,” then contact the appropriate maintenance support organization for further technical assistance.

.....

**24** Notify the person responsible for all service and protection signals assigned to this circuit pack that the signals can be returned to service.

.....

**25** Reinstall the shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

.....

**26** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS

.....



## TAP-132: Clear 'Topology Construction In Progress'

**Overview** This is normally a transient condition. Follow the procedure below to clear it.

### Procedure

- 1 Wait 30 - 60 minutes, depending on system size, or until the CR/PROMPT, MJ/DEFERRED or MN LED goes off.
- 2 At the CIT, initiate a login session. For details, refer to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- 3 At the CIT, select **REPORTS - Conditions** to obtain a report.
- 4 Has the **topology construction in progress** condition cleared?

| IF...      | THEN...                                                                                                            |
|------------|--------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                                             |
| <b>NO</b>  | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> , to clear the unexpected response. |

END OF STEPS



## TAP-133: Clear 'FLASH Removed'

---

**Overview** This procedure explains how to replace a FLASH memory module (FMM) that has been removed from the SYSMEM slot of the SYSCTL.

**Important!** Expect to see this condition when using the CIT to select the following menu items (in the order listed):

**CONFIGURATION > EQUIPMENT> BOS PACK > ENABLE FMM REMOVAL**



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in this procedure could result in service interruptions.*

### Procedure



### CAUTION

*Do not insert a FLASH Memory Module (FMM) into the SYSMEM slot of a BOS-BAYCTL or BOS-OHCTL circuit pack. This will cause loss of service.*

- 1 Is the red LED on the BOS() SYSCTL circuit pack ON continuously?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 2.                                                                                                                       |
| <b>NO</b>  | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |

- 2 Is the same FMM that was removed from this Network Element (NE) or a FMM with the same software version currently active on this NE available?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 3.                                                                                                                       |
| <b>NO</b>  | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |

**WARNING**

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 3 Install the replacement FMM obtained in Step 2 into the BOS() SYSCTL SYSMEM slot. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 4 Wait approximately 5–15 minutes.

- 5 Is the red LED on the BOS() SYSCTL circuit pack blinking ON and OFF?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 6.                                                                                                                       |
| <b>NO</b>  | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |

- 6 At the CIT, select **REPORTS - Conditions** to obtain another report.

- 7 Is the same alarm condition still listed under the DESCRIPTION column of the report?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |
| <b>NO</b>  | Continue with Step 8.                                                                                                                       |

.....

**8** Click on the bay where the BOS ( ) SYSCTL (CP10) is located.

.....

**9** Click on the shelf where the BOS ( ) SYSCTL (CP10) is located.

.....

**10** Click on the SYSCTL (CP10) circuit pack.

.....

**11** At the CIT, click on **CONFIGURATION-Equipment**.

.....

**12** Select **Disable** for the FMM Removal.

.....

**13** Click on the **Apply** button.

.....

**14** Is the red LED on the BOS() SYSCTL circuit pack OFF?

| IF...      | THEN...                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 16.                                                                                                                      |
| <b>NO</b>  | Consult the appropriate maintenance support organization for technical assistance before proceeding with other trouble clearing procedures. |

.....

**15** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).



- .....
- 16** Is the CR/PROMPT, MJ/DEFERRED, or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Proceed to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                    |

.....

END OF STEPS

.....



# TAP-144: Clear 'OMU/ODU warm-up in progress'

**Overview** This condition indicates that the optical filters in the OMU/ODU circuit packs are below their correct operating temperature and the heater is in the process of correcting the filter temperature.

## Procedure

- 1 Wait 15 minutes or until the OMU/ODU warm-up in progress clears.

- 2 Did the OMU/ODU warm-up in progress clear?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 3.                                                            |
| <b>NO</b>  | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |

- 3 Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted?

| IF...      | THEN...                                                                                |
|------------|----------------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b>                                        |

END OF STEPS



## TAP-152: Address Incoming (LOF/LOS/LOL) Signal Failure

---

**Overview** This procedure explains how to troubleshoot an incoming signal failure condition.

**Important!** One of the following incoming signal failures was detected:

- Incoming HSBB LOL failure
- Incoming HSBB LOS failure
- Incoming OCH 10G LOS failure
- Incoming OCH 10G LOF failure
- Incoming OC-48/STM16 LOF failure
- Incoming OC-48/STM16 LOS failure
- Incoming OC-192/STM64 LOF failure
- Incoming OC-192/STM64 LOS failure

**Procedure** **Important!** When LOF occurs, the LOF condition may be reported as LOS by the OC-192/STM-64 Optical Translator Units (OTUs). Incoming OCH 10G LOF/LOS Alarm Conditions only appear when the OC-192 OTU is provisioned in either the repeater mode or the sink mode.

---

**1** Refer to the AID column of the **REPORTS- Conditions** and determine the bay location of the OTU with the incoming failure.

---

**2** Remove the appropriate shelf cover. All connections can be accessed from the front. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

---



### CAUTION

*SERVICE AFFECTING - Step 3 could result in service interruption.*

- 3 Make a visual inspection of the incoming signal cable(s) and connections and correct any problems found. For details, go to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).

- 4 Did a visual inspection reveal any problems?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 5. |
| <b>NO</b>  | Continue with Step 7. |

- 5 At the CIT, select **REPORTS- Conditions** to obtain a report.

- 6 Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 28. |
| <b>NO</b>  | Continue with Step 7.  |

- 7 Is the failure condition a LOS or LOF/LOL failure?

| IF...          | THEN...                |
|----------------|------------------------|
| <b>LOS</b>     | Continue with Step 8.  |
| <b>LOF/LOL</b> | Continue with Step 16. |



## CAUTION

*SERVICE AFFECTING - Step 8 could result in service interruption.*

- 8 Notify the person responsible for the optical line or optical channel associated with the service or protection signals assigned to this circuit pack to: 1) manually switch the service line or optical channel to a protection line, and 2) ensure that all protection lines or optical channels that are assigned to this circuit pack are not being used for

service. Another option is to restore service on a different Optical Line System or route.

**Important!** Because OC-192/STM-64 OTUs may report LOS instead of LOF when LOF occurs, this step will measure the optical power to distinguish between the two conditions.

- 9 Make an optical power measurement on the incoming optical jumper at the OTU. For details, go to DLP-524: Connect Optical Power Meter for Measurement at OTU () IN () Port (10-52).

- 10 Was the optical power measurement within the limits?

| IF... | THEN...                |
|-------|------------------------|
| NO    | Continue with Step 11. |
| YES   | Continue with Step 16. |

- 11 Is this OTU port associated with an ORS?

| IF... | THEN...                                                                                                                   |
|-------|---------------------------------------------------------------------------------------------------------------------------|
| NO    | Continue with Step 12.                                                                                                    |
| YES   | Continue with <a href="#">“TAP-234: Address ‘Incoming LOS Signal Failure When OTU is Associated with ORS’” (13-242)</a> . |

- 12 Clean the incoming fiber jumper. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- 13 Connect the incoming fiber jumper to the correct OTU IN port.

**Important!** At this point, it appears that the local OTU is operating correctly. The trouble appears to be in the optical fiber jumper, optical line, or in the far-end network element.

- 14 Initiate a Trouble Report to the source of the failed incoming signal indicating the type of failure. If the source of the failed incoming

signal returns a Trouble Report indicating "no trouble found," then contact the appropriate maintenance support organization for further technical assistance before following the prescribed operating procedures to fault isolate the fiber jumper carrying the failed incoming signal. For details, go to ["DLP-507: Identify Source of Incoming Signal" \(14-10\)](#).

.....

**15 STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

.....



**CAUTION**

*SERVICE AFFECTING - Step 16 could result in service interruption.*

**Important!** Only the HSBB OTU provides LOL indications. The clock and data recovery (CDR) circuit in the OTU receiver monitors LOL signal.

- 16** Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this circuit pack to:
- 1) manually switch the service line or channel to a protection line, and
  - 2) ensure that all protection lines or channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.
- .....

- 17** Remove the OTU indicating the incoming failure from the shelf. For details, go to ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#).
- .....



**CAUTION**

*The replacement OTU must have the same (or higher) circuit pack series number.*

- 18** Obtain and install the replacement OTU. For details, go to ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#).

- .....
- 19** At the CIT select **REPORTS- Conditions** to obtain a report.
- .....

- 20** Did the incoming failure clear?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 27. |
| <b>NO</b>  | Continue with Step 21. |

.....

- 21** Remove the optical jumper, reclean and reconnect it to the OTU. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 22** Did the incoming failure clear?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 27. |
| <b>NO</b>  | Continue with Step 23. |

.....

- 23** As required, check for a broken LBO, a damaged jumper, or bent or broken pins; replace using the BERG MT370-01 pin kit for the METRAL pins. Refer to backplane pin repair/replacement procedures in the *WaveStar® OLS 1.6T Installation Manual* (365-575-717R6.2).
- .....

- 24** Reinstall the original OTU that was removed in Step 17. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 25** Connect the optical fibers to the original OTU.
- .....

- 26** Initiate a Trouble Report to the source of the failed incoming signal indicating the type of failure. If the source of the failed incoming signal returns a Trouble Report indicating “no trouble found,” then contact the appropriate maintenance support organization for further technical assistance before following the prescribed operating procedures to fault isolate the fiber jumper carrying the failed

incoming signal. For details, go to [“DLP-507: Identify Source of Incoming Signal” \(14-10\)](#).

.....

- 27** Notify the person responsible for all service and protection signals assigned to this circuit pack that they can be returned to service.
- .....

- 28** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

.....  
E N D   O F   S T E P S  
.....





## TAP-156: Clear 'J0 Mismatch'

---

**Overview** This procedure is used to clear the J0 mismatch condition. The WaveStar® OLS 1.6T reads the section trace byte (J0) in the section overhead as OC-48/OC-192 signal. The Optical Translator Units (OTUs) are the only circuit packs capable of reading the section trace byte. This condition indicates that the incoming section trace does not match the expected incoming section trace.

### Procedure

---

**Important!** An upstream transmission failure could cause multiple J0 Mismatch alarms. **Before attempting to clear this alarm, log in to the upstream network element for an NE Alarm List report for a transmission alarm and clear any transmission alarms.**

- 1 At the CIT, from the NE Equipment Explorer, select the appropriate bay shelf and OTU port. From the Main menu, select **FAULT-Analysis-OTU Section Trace** to obtain a report.

---

- 2 Determine from the local office records what is the correct expected incoming message for this OC-48/OC-192.

---

- 3 Do the office records for the expected incoming message match the data in the Expected Incoming Message listed in the report from Step 1?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 4.  |
| <b>NO</b>  | Continue with Step 11. |

---

- 4 At the CIT, select **REPORTS- Conditions** to obtain an updated report.

---

- 5 Trace the fiber jumper connected to the IN port of the OTU, identified in the AID column, back to the source.

- 6 Do the office records indicate that the fiber jumper is connected to the correct source?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 14. |
| <b>NO</b>  | Continue with Step 7.  |



### CAUTION

*SERVICE AFFECTING - Step 7 could result in service interruption.*

- 7 Using local procedures connect the fiber jumper to the correct source.

- 8 At the CIT, select **REPORTS - Conditions** to obtain an updated report.

- 9 Is the J0 mismatch condition still present?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 14. |
| <b>NO</b>  | Continue with Step 10. |

- 10 ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***

- 11 At the CIT, select **FAULT-Analysis-OTU Section Trace** and enter the correct expected incoming message and click OK.

- 12 At the CIT, select **REPORTS- Conditions** to obtain an updated report.

- 13 Is the J0 mismatch condition still present?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                           |

.....

**Important!** At this point, it appears that the local network element is operating correctly.

- 14** Initiate a Trouble Report to the upstream network element of the OTU indicating the J0 mismatch.

END OF STEPS

.....



# TAP-160: Clear 'Power "A or B" for "Fan 1 or 2" Failures'; or 'Power "A and B" for "Fan 1 or 2" Failures'

**Overview** A problem in the fan assembly unit has caused the circuit breakers on the front panel of the fan assembly to operate.

Power "A" for "Fan 1" Failure: or

Power "A" for "Fan 2" Failure; or

Power "B" for "Fan 1" Failure; or

Power "B" for "Fan 2" Failure; or

Power "A" and Power "B" for "Fan 1" Failure; or

Power "A" and Power "B" for "Fan 2" Failure

## Procedure

- 1 Replace the fan assembly associated with the operated circuit breaker. For details, go to ["DLP-527: Replace Fan Assembly" \(14-58\)](#).

- 2 At the CIT, select **REPORTS - Conditions** to obtain a report.

- 3 Refer to the report obtained in Step 2, and determine if any of the above listed types of failure are listed?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | Continue with Step 4.                                  |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

- 4 Contact the appropriate maintenance support organization for further technical assistance. This failure indicates a problem in power cabling between the fan assembly unit and "A" or "B" feeder cables.

END OF STEPS



# TAP-162: Clear 'Fan "1" or "2" or Clogged Dust Filter "1" or "2" Failure'

**Overview** One or more of the fans have failed or the dust filter is clogged.

## Procedure

- 1 Refer to the AID column of the **REPORTS- Conditions** and determine the bay location for the appropriate dust filter for the failed fan.

**Important!** Replace **ALL** dust filters in the bay with a Clogged dust filter 1 or 2 **or both alarm conditions**.

- 2 Replace all dust filters in the bay with the clogged filter alarm conditions. For details, go to [“DLP-526: Inspect/Replace Dust Filter” \(14-56\)](#).

- 3 Was the dust filter replaced?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 4. |
| <b>NO</b>  | Continue with Step 6. |

**Important!** Wait 10 minutes for the system temperature to stabilize.

- 4 At the CIT, select **REPORTS - Conditions** to obtain a report.

- 5 Referring to the report obtained in Step 4, is the Clogged dust filter "1" or "2" still listed?

| IF...      | THEN...                                         |
|------------|-------------------------------------------------|
| <b>YES</b> | Continue with Step 6.                           |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |

.....

**Important!** Ensure that there is an available supply of replacement fan assemblies.

- 6** Replace the fan assembly with a new one. For details, go to [“DLP-527: Replace Fan Assembly” \(14-58\)](#).
- .....

- 7** At the CIT, select **REPORTS- Conditions** to obtain a report.
- .....

- 8** Referring to the report obtained in Step 7, is the Fan Failure "1" or "2" still listed?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Consult the appropriate maintenance support organization for further technical assistance. |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                     |

END OF STEPS

.....



## TAP-166: Clear 'APSD Active-Line'

**Overview** This procedure is used to clear the APSD active-line condition. WaveStar® OLS 1.6T reduces the OA circuit pack output power to safe levels if an incoming signal loss is detected. The incoming signal loss is caused by a fiber cut, removed connectors or equipment failures. When the incoming signal loss is repaired, the system will resume normal operation and the APSD active - line condition will clear.

**Procedure** **Important!** This condition is caused by an upstream facility failure or a failure on the receive side of the NE.

- 1 Are there any fault conditions with the same line identifier in the AID column in the report?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 2. |
| <b>NO</b>  | Continue with Step 4. |

**Important!** While following the instructions in the procedure(s) to which you will now be sent, you must ignore the APSD active - line **condition in the NE Condition List.**

- 2 Locate the condition identified in Step 1 of this procedure in Table 13-1, "Trouble Clearing Task Index" (13-5) of ["TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA" \(13-8\)](#). Proceed to the indicated TAP to clear the condition. Remember to ignore the APSD active -line condition throughout the remainder of the trouble clearing procedure.

- 3 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

- 4 Wait 5 minutes.

- 5 At the CIT, select **REPORTS- Conditions** icon to obtain an updated report.

- .....
- 6 Is the APSD active - line condition still listed?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | Continue with Step 7.                                  |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

- .....
- 7 At this point, it appears that the local network element is operating correctly.

- .....
- 8 Initiate a Trouble Report to the upstream network element on this line indicating the APSD active - line condition.

END OF STEPS

.....





## TAP-167: Clear 'APSD Active-ODU'

**Overview** The WaveStar® OLS 1.6T reduces the OA circuit pack output power to safe levels if an incoming loss of signal to the ODU circuit pack is detected. The incoming loss of signal is caused by a fiber cut, removed connectors, or equipment failures. When the incoming loss of signal is repaired, the WaveStar® OLS 1.6T will resume normal operation and the APSD active condition will clear.

### Procedure

- 1 Are there any fault conditions with the same line identifier in the **AID** column of the report?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 2. |
| <b>NO</b>  | Continue with Step 4. |

**Important!** While following the instructions in the procedure(s) to which you will now be sent, you **MUST** ignore the APSD active condition in the **REPORTS- Conditions** report.

- 2 Find the condition identified in Step 11 of this procedure in Table 13-2, "Trouble Condition — TAP Cross Reference" (13-9) of ["TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA" \(13-8\)](#) and go to the indicated TAP to clear the condition (ignoring the APSD active-ODU) condition throughout the remainder of the trouble clearing procedure).

- 3 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

- 4 Wait 5 minutes.

- 5 At the CIT, select **REPORTS - Conditions** to obtain an updated report.

- 6 Is the APSD Active-ODU condition still listed?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | Continue with Step 7.                                  |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

7 Identify the appropriate shelf associated with the failure condition.

8 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 9 could result in service interruption.*

9 Notify the person responsible for the optical line associated with the service or protection signals assigned to this circuit pack to: 1) manually switch the service line to a protection line, and 2) ensure that all protection lines that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.

10 Replace the fiber jumper between OA OUT and ODU IN ports. For details, see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

11 At the CIT, select **REPORTS- Conditions** to obtain an updated report.

12 Is the APSD Active-ODU condition still listed?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | suspect the OA as the cause and continue with Step 13. |
| <b>NO</b>  | Continue with Step 18.                                 |

- .....
- 13** Obtain a replacement OA circuit pack with the same or a higher series number and install it in place of the OA circuit pack associated with the APSD Active-ODU. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 14** Wait 5 minutes for the OA Fault LED to clear.
- .....

- 15** Is the APSD Active-ODU still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 16. |
| <b>NO</b>  | Continue with Step 18. |

- .....
- 16** Remove the replacement OA installed in Step 13 and reinstall the original OA circuit pack removed in Step 13.
- .....

- 17** Contact the appropriate maintenance support organization for further technical assistance.
- .....

- 18** Notify the person responsible for the affected service protection signals assigned to this OA that this optical line can now be returned to service.
- .....

- 19** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 20** Baseline the replaced OA circuit pack. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
- .....

- .....
- 21** Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                    |

.....

END OF STEPS

.....



## TAP-174: Clear 'Insufficient Span Loss (<10 dB)'

---

**Overview** This procedure is used to clear a condition where the downstream OA is receiving too much power due to the span loss being <10 dB.

**Important!** This condition can be caused by missing or wrong LBO value downstream at the receive OA, or a defective OA. Other alarm conditions may be associated with this alarm and should be cleared first.

### Procedure

---

**Important!** Span loss information is unique to each fiber type and distance. Check office records to determine the proper span loss or consult the appropriate maintenance support organization for technical assistance before proceeding.

- 1 At the CIT, select **REPORTS- Conditions** to obtain an updated report.

---

- 2 Does the **REPORTS- Conditions** report show an Insufficient Span Loss condition?

| IF...      | THEN...                    |
|------------|----------------------------|
| <b>YES</b> | Then continue with Step 4. |
| <b>NO</b>  | Then continue with Step 3. |

---

- 3 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

---

- 4 Remove the shelf cover(s) associated with the OA(s). For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

**Important!** Office records should provide the required LBO values for the system. If not, consult the appropriate Technical Support organization for further technical assistance.



## CAUTION

*SERVICE AFFECTING - Step 5 could result in service interruption.*

- 5 Visually inspect the incoming signal cable(s) and connection(s) which should include the proper LBO values for the affected span and correct any problem found. For details, go to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).

- 
- 6 Did a visual inspection reveal any problems?

| IF... | THEN...                                         |
|-------|-------------------------------------------------|
| YES   | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| NO    | Continue with Step 7.                           |

---

**Important!** At this point, it appears that the local Insufficient Span Loss condition may be caused by the downstream Network Element.

- 7 Initiate a Trouble Report to the downstream Network Element indicating the type of failure. If the downstream Network Element returns a Trouble Report indicating “No Trouble Found” then contact the appropriate maintenance support organization for further technical assistance before following the locally prescribed operating procedures to fault isolate the reason for low span loss.

END OF STEPS



## TAP-177: Test LED In-Progress

---

**Overview** This condition means that a LED test is being performed on this node. The user activated test may repeat itself 10 times (100 seconds).

**Procedure** .....

- 1 Wait for the LED tests to be completed.  
.....
- 2 Did the TEST LED tests in-process condition clear?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Then <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                      |
| <b>NO</b>  | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |

END OF STEPS



# TAP-178: Clear SUPVY Add Input LOS

**Overview** This procedure is used to clear an alarm condition where an OA circuit pack detects loss of incoming SUPVY signal from SUPVY OUT port to OA SUP Tx port.

**Procedure**      **Important!** SUPVY Add Input LOS condition will cause the following conditions at three different locations, which are:

- From the Local End Terminal, will see Express SUPVY DL Failure and Local SUPVY DL Failure
- From the Repeater, will see Local SUPVY DL Failure and Incoming SUPVY Channel LOS
- From the Far End Terminal, will see Express DL Failure.

1 At the CIT, select **REPORTS- Conditions** to obtain a report.

2 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).



## CAUTION

*SERVICE AFFECTING - Step 3 could result in service interruption.*

3 Visually inspect the incoming signal cable(s) and connection(s) between the SUPVY (OUT) and OA (SUP TX) circuit packs and correct any problems found. For details, go to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).

4 Did the visual inspection result in correcting any problems?

| IF... | THEN...                |
|-------|------------------------|
| YES   | Continue with Step 15. |



| IF... | THEN...               |
|-------|-----------------------|
| NO    | Continue with Step 5. |

**CAUTION**

*SERVICE AFFECTING - Step 5 could result in service interruption.*

- 5 Replace the SUPVY circuit pack that is connected to the OA (SUP TX) indicated in the AID column of the report from Step 1. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 6 Obtain another report (refer to Step 1). Is the same failure condition still listed?

| IF... | THEN...                |
|-------|------------------------|
| YES   | Continue with Step 7.  |
| NO    | Continue with Step 15. |

**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 7 could result in service interruption.*

- 7 Remove the replacement circuit pack (installed in Step 5) and reinstall the original circuit pack. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 8 Notify the person responsible for the service or protection signals assigned to this OA to:
  - Manually switch the service line to a protection line
  - Ensure all protection lines assigned to this OA are not being used for service.

- 9 Replace the OA circuit pack as indicated in the AID column of the report from Step 1. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 10 Obtain another report (as in Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 11. |
| <b>NO</b>  | Continue with Step 14. |

- 11 Remove the replacement circuit pack (installed in Step 9) and reinstall the original circuit pack. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).



### CAUTION

*SERVICE AFFECTING - Step 12 could result in service interruption.*

- 12 Replace the fiber jumper between the SUPVY (OUT) and OA (SUPTX) circuit pack.

- 13 Obtain another report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Contact the appropriate maintenance support organization for further technical assistance. |
| <b>NO</b>  | Then continue with Step 14.                                                                |

- .....
- 14** Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA that the Optical Line can now be returned to service.
- .....
- 15** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....
- 16** Baseline the replaced circuit pack. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).

.....

END OF STEPS

.....



## TAP-179: Clear 'Topology Construction Incomplete'

**Overview** This procedure is used to clear a controller or transmission failure in the ring network.

### Procedure

**Important!** This condition usually is cleared with the assistance of the Operations System Control Center. When the network is in this state, you will probably not be able to establish a login to one or more of the other nodes. If a remote login is possible and you need additional help, refer to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#). Otherwise, local CIT assistance will be required at those nodes.

- 1 At the local network element CIT select **REPORTS- Conditions** and obtain a report.

- 2 Does a controller circuit pack condition (BOS failure, BOS removed, SUPVY failure, SUPVY removed) or an incoming alarm condition (SUPVY channel fail) appear in the report?

| IF...      | THEN...                                                                                        |
|------------|------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | Continue with Step 3.                                                                          |

- 3 Using office records for the network elements in the system, can you establish a login to a remote node?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 4. |
| <b>NO</b>  | Continue with Step 8. |

- .....
- 4 Establish a login to any of the other network elements. For detail, go to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- .....

- 5 At the CIT, select **REPORTS- Conditions** to obtain a report.
- .....

- 6 Does a controller circuit pack condition or an incoming alarm condition appear in the report?

| IF...      | THEN...                                                                                        |
|------------|------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | Continue with Step 7.                                                                          |

.....

- 7 Repeat Step 4 through Step 6 for each of the remaining network elements listed in your office records, if possible.
- .....
- 8 Contact other nodes on the ring for local CIT assistance at those nodes or consult the Operations System Control Center and the appropriate technical maintenance support organization for assistance.

END OF STEPS

.....



## TAP-180: Clear 'WAD Drop Channel LOS'

**Overview** The power detector in the WAD circuit pack that is upstream from the loop out port has detected a loss of drop channel optical power.

### Procedure

- 1 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 2 could result in service interruption.*

- 2 Notify the person responsible for the optical line associated with the service or protection signals assigned to this WAD circuit pack to:
  - Manually switch the service to a protection line.
  - Ensure all protection paths assigned to this WAD are not being used for service.

- 3 Replace the WAD circuit pack associated with this failure condition. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 4 At the CIT, select **REPORTS- Conditions** to obtain a report.

- 5 Is WAD drop channel LOS still reported?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 6. |
| <b>NO</b>  | Continue with Step 8. |

- .....
- 6** Consult the appropriate Technical Support organization for further technical assistance.
- .....

- 7** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***
- .....

- 8** Notify the person responsible for the optical line associated with the service or protection signals assigned to this WAD circuit pack that it can now be returned to service.
- .....

- 9** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 10** Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                    |

END OF STEPS

.....



## TAP-181: Clear 'SUPVY Drop Output LOS'

---

**Overview** This procedure is used to clear a SUPVY drop output LOS condition detected by the receive OA circuit pack.

### Procedure

---

- 1 At the CIT, select **REPORTS- Conditions** and obtain an NE Alarm List report.  

---
- 2 Travel to the location or get assistance at the adjacent upstream network element.  

---
- 3 At the upstream network element, check for the SUPVY circuit pack failure, SUPVY ADD INPUT LOS or any SUPVY channel failure condition.

| IF...      | THEN...                                                                                     |
|------------|---------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer the Trouble Report to that office.<br><b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| <b>NO</b>  | Continue with Step 4.                                                                       |

---

- 4 At the CIT, select **REPORTS- Conditions** and obtain a report.  

---
- 5 Remove the appropriate shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).  

---



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 6 could result in service interruption.*



- 6 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to:
- Manually switch the service line to a protection line
  - Ensure all protection lines assigned to this OA are not being used for service.

- 7 Replace the OA circuit pack as indicated in the AID column of the report from Step 1. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 8 Obtain another report (as in Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 9.  |
| <b>NO</b>  | Continue with Step 14. |



### CAUTION

*SERVICE AFFECTING - Step 9 could result in service interruption.*

- 9 Remove the replacement circuit pack (installed in Step 4) and reinstall the original circuit pack. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 10 At this point, it appears that the local network element is operating correctly.
- 11 Initiate a Trouble Report to the upstream network element of the optical line. If the source of the upstream network element returns a Trouble Report indicating “No Trouble Found,” then contact the appropriate maintenance support organization for further technical assistance before following the prescribed operating procedures to

fault isolate the cable/fiber carrying the failed incoming signal. For details, go to [“DLP-507: Identify Source of Incoming Signal” \(14-10\)](#).

.....

- 12** Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA that the Optical Line can now be returned to service.
- .....

- 13** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 14** Baseline the replaced circuit pack. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).

END OF STEPS

.....



## TAP-182: Clear 'OW1TYPE, OW2TYPE, or OW3TYPE'

**Overview** This condition is caused by a provisioned difference between the OW1TYPE, OW2TYPE and OW3TYPE parameters and office records for the specified supervisory channels order wire(s) between the east and west sides of the Network Element. While provisioning the orderwire(s), the east and west sides must be provisioned the same. Otherwise, the above alarm condition(s) will be activated to make you aware that both sides are not provisioned the same. Clicking on the help screen button below the alarm condition will provide details on provisioning the parameters.

### Procedure

- 1 At the CIT, from the NE Equipment Explorer, click on the bay, shelf and **SUPVY CP** and **line ()** and click **Provision**. From the Main menu, select **CONFIGURATION-Equipment**.

- 2 Are the parameters provisioned per the office records?

| IF...      | THEN...                                                                        |
|------------|--------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">"TAP-108: Address Missing or Incorrect Response" (13-23)</a> |
| <b>NO</b>  | Then continue with Step 4.                                                     |

- 3 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

- 4 From the office records, determine the correct provisioning parameters.

**Important!** If required, refer to the *WaveStar® OLS 1.6T Installation Manual, Release 6.2*, (365-575-717R6.2) for orderwire provisioning information).

- 5 Provision the various parameters to the correct parameter(s) per the office records and click on the **Apply** button.

END OF STEPS



## TAP-184: Clear 'Bay Bus Failure, BC Bus Failure, OH Bus Failure'

**Overview** A system fault algorithm has determined that a communications bus has failed. This could be caused by a circuit pack failure or bay cable problem. The actions required to clear this trouble are unique in that just replacing the failed circuit pack will not clear the fault condition, after the failed circuit pack is replaced the system must be reset.

### Procedure

- 1 At the CIT, select **REPORTS- Conditions** to obtain a report.

**Important!** The audit subsystem may fail other circuit packs.

- 2 Identify the failed circuit pack(s) listed **before** the Bay Bus Failure, BC Bus Failure or OH Bus Failure alarm conditions.

- 3 Identify the appropriate shelf (listed in the AID column) associated with the Circuit Pack Failure alarm condition in Step 2. Replace this circuit pack **first**.

- 4 Remove the appropriate shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 5 Is the Fault LED lighted on the circuit pack identified in the AID column?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 6.                                                            |
| <b>NO</b>  | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |

- 6 Is the circuit pack to be replaced an OA/OTU/OMU/ODU/ORS/WAD circuit pack?

| IF...      | THEN...                                                         |
|------------|-----------------------------------------------------------------|
| <b>YES</b> | Continue with Step 7.                                           |
| <b>NO</b>  | Continue with Step 8 (for BOS(), SYSCTL, EI, OMON, or SUPVY()). |



## CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 7 could result in service interruption.*

- 7 Notify the person that is responsible for the optical line or channel associated with the service or protection signals assigned to this circuit pack to
  - manually switch the service line or channel to a protection line and
  - to ensure that all protection lines or channels that are assigned to this circuit pack are not being used for service.

Another option is to restore service on a different Optical Line System or route.

**Important!** A series number S1:2 is the same series number as S1:4. The 2 and 4 refer to minor changes within a series 1. The replacement circuit pack will not boot at this time, so if an OTU circuit pack is being replaced the laser will not turn on, therefore the value of the OTU port LBO cannot be determined at this time.



## CAUTION

*SERVICE AFFECTING - Step 8 could result in service interruption.*

- 8 Obtain a replacement circuit pack with the same or higher series number and install it in place of the circuit pack with the lighted

FAULT LED. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).



## WARNING

*Automatic Power Shutdown (APSD) of the OA output will not be available during the system reset caused by the following maintenance action.*

- 9 At the CIT, select **FAULT-Reset** and in the Reset Dialog box select System and click the **OK** button to reset the network element or press the **Restart** button on the EI circuit pack (User Panel).
- 10 Wait 15-60 minutes, depending on system size, or until the MJ LED is off at the EI circuit pack (User Panel), or whichever comes first.
- 11 At the CIT, select **REPORTS - Conditions** to obtain another report.
- 12 Is the FAULT LED lighted on the replacement circuit pack?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Contact the appropriate maintenance support organization for further technical assistance. |
| <b>NO</b>  | Continue with Step 13.                                                                     |

- 13 Was an OTU circuit pack just replaced?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 14  |
| <b>NO</b>  | Continue with Step 15. |



## CAUTION

*SERVICE AFFECTING - Step 14 could result in service interruption.*

- 14 If required, the OTU (OUT) port LBO can now be determined. For details, go to [“DLP-528: LBO Application” \(14-59\)](#).

- 15 Was an OA/OMU/ODU/ORS/WAD circuit pack replaced?

| IF...      | THEN...                                                        |
|------------|----------------------------------------------------------------|
| <b>YES</b> | Continue with Step 16.                                         |
| <b>NO</b>  | Continue with Step 17 for BOS(), SYSCTL, EI, OMON, or SUPVY(). |

- 16 Notify the person that is responsible for the optical line associated with the service or protection signals assigned to this OA/OMU/ODU/ORS/WAD circuit pack that this Optical Line can now be returned to service.

- 17 Reinstall the shelf cover(s). For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 18 Perform baseline on the OA if it was replaced. For details refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).

- 19 Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack (User Panel)?

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |

| IF... | THEN...                                         |
|-------|-------------------------------------------------|
| NO,   | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |

END OF STEPS



## TAP-186: Clear 'OMS (OA) LOS'

---

**Overview** Optical Multiplex Section (OMS) is used to define the line between the Optical Multiplex Unit (OMU) OUT connector and IN connector of the Optical Amplifier (OA). This condition indicated that the OA has detected a total loss of signal.

**Procedure** **Important!** A minimum of two associations must be present on the system to prevent this alarm.

---

- 1 At the CIT, select **REPORTS- Conditions** to obtain a report.

---

- 2 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

---




### CAUTION

*SERVICE AFFECTING - Step 3 could result in service interruption.*

- 3 Visually inspect the incoming signal cable between the OMU1 OUT port and the OA IN port and correct any problems found. For details, go to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).

---

- 4 Did the visual inspection result in correcting any problems?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 5. |
| <b>NO</b>  | Continue with Step 6. |

---

- 5 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 6.  |
| <b>NO</b>  | Continue with Step 17. |

**CAUTION**

*SERVICE AFFECTING - Step 6 could result in service interruption.*

- 6 Notify the person responsible for the optical line associated with the service or protection signals assigned to this optical multiplex section to:
  - Manually switch the service line(s) or channel (s) to a protection line(s).
  - Ensure all protection lines assigned to this OMU1 are not being used for service.

- 7 Replace the fiber jumper between the OMU1 OUT port and the OA IN port.

- 8 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 9.  |
| <b>NO</b>  | Continue with Step 16. |

- 9 Replace the OA associated with this optical multiplex section. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 10 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 11. |
| <b>NO</b>  | Continue with Step 16. |

- .....
- 11** Remove the replacement circuit pack (installed in Step 9) and reinstall the original circuit pack. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 12** Replace the OMU1 associated with this optical multiplex section. For details, go to “DLP-514: Remove and/or Install Circuit Pack” (14-30).
- .....

- 13** Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 14. |
| <b>NO</b>  | Continue with Step 16. |

- .....
- 14** Remove the replacement circuit pack (installed in Step 9) and reinstall the original circuit pack. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 15** Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Contact the appropriate maintenance support organization for further technical assistance. |
| <b>NO</b>  | Continue with Step 16.                                                                     |

- .....
- 16** Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this optical multiplex section that the section can be returned to service.
- .....

.....

**17** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

.....

**18** Perform baseline on the OA if it was replaced. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).

.....

**19** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***

.....

END OF STEPS

.....



## TAP-188: Clear 'OMS (ODU) LOS'

**Overview** Optical Multiplex Section (OMS) is used to define the line between the Optical Amplifier (OA) OUT connector and IN connector of the Optical Demultiplexer Unit (ODU/ODUL). This condition indicated that the ODU/ODUL has detected a loss of signal.

### Procedure

- 1 At the CIT, select **REPORTS- Conditions** to obtain a report.
- 2 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).



### CAUTION

*SERVICE AFFECTING - Step 3 could result in service interruption.*

- 3 Visually inspect the incoming signal cable between the OA OUT port and the ODU/ODUL port and correct any problems found. For details, go to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).
- 4 Did the visual inspection result in correcting any problems?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 5. |
| <b>NO</b>  | Continue with Step 6. |

- 5 Obtain another **REPORTS - Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 6. |

| IF...     | THEN...                |
|-----------|------------------------|
| <b>NO</b> | Continue with Step 18. |

**CAUTION**

*SERVICE AFFECTING - Step 6 could result in service interruption.*

- 6 Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this optical multiplex section to:
  - Manually switch the service line(s) or channel(s) to a protection line(s).
  - Ensure all protection lines or channels assigned to this ODU/ODUL are not being used for service.

- 7 Replace the fiber jumper between the OA OUT port and the ODU/ODUL port.

- 8 Obtain another **REPORTS - Conditions** (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 9.  |
| <b>NO</b>  | Continue with Step 16. |

- 9 Replace the OA associated with this optical multiplex section. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 10 Obtain another **REPORTS- Conditions** (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 11. |

| IF...     | THEN...                |
|-----------|------------------------|
| <b>NO</b> | Continue with Step 16. |

- .....
- 11** Remove the replacement circuit pack (installed in Step 9) and reinstall the original circuit pack. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 12** Replace the ODU/ODUL associated with this optical multiplex section. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 13** Obtain another **REPORTS - Conditions** (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 14. |
| <b>NO</b>  | Continue with Step 16. |

- .....
- 14** Remove the replacement circuit pack (installed in Step 9) and reinstall the original circuit pack. For details, go to “DLP-514: Remove and/or Install Circuit Pack” (14-30).
- .....

- 15** Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Contact the appropriate maintenance support organization for further technical assistance. |
| <b>NO</b>  | Continue with Step 16.                                                                     |

- .....
- 16** Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this optical multiplex section that the section can be returned to service.

- 
- 17** Perform baseline on the OA if it was replaced. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
- 
- 18** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

END OF STEPS

---





## TAP-190 Clear "OMON LOS"

---

**Overview** This procedure is used to clear a loss of optical signal (LOS) condition detected by the OMON circuit pack.

**Important!** If the alarm condition 'DCM Failure' is present in the alarm list report, go to ["TAP-212: Clear 'DCM Failure' and/or Isolate Defective DCM Connections" \(13-179\)](#) and clear the 'DCM Failure' alarm before attempting to clear the 'OMON LOS' alarm condition.

**Procedure** **Important!** Wait 15 minutes for the system to scan the OMON inputs after removing and installing cables between the OMON and OA or replacing the OMON or OA circuit pack.

- 
- 1 At the CIT, select **REPORTS - Conditions** to obtain a report.
  - 2 Identify and locate the OMON circuit pack (and IN() port) listed in the AID column of the **REPORTS - Conditions** report (see Step 1)
  - 3 Remove the appropriate shelf cover. For details, go to ["DLP-511: Install/Remove Shelf Cover" \(14-20\)](#).
  - 4 Identify the OA circuit pack that is associated with the OMON port determined in Step 2. You may use the fiber label on the fiber that is assigned to the OMON IN() port or refer to the *WaveStar® OLS 1.6T Installation Manual*, (365-575-717R6.2), for information on fiber connection to identify the circuit pack and signal source
  - 5 Visually inspect the connections between the OMON port on the OA and the IN() port on the OMON and correct any problems found. For details, go to ["DLP-517: Inspect Optical Fiber\(s\)" \(14-42\)](#).
  - 6 Did the visual inspection result in correcting any problems?
-

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 7. |
| <b>NO</b>  | Continue with Step 8. |

- 7 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 8.  |
| <b>NO</b>  | Continue with Step 28. |

- 8 Remove the fiber from the OMON port of the OA identified in Step 2.

- 9 Connect an optical power meter to the OMON port of the OA and obtain an optical power measurement

**Important!** The power level will vary depending on the number of channels, path loss, C or L band.

- 10 Is the power level greater than -37 dBm?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 11. |
| <b>NO</b>  | Continue with Step 21. |

- 11 Reconnect the fiber that was removed from the OMON port of the OA.

- 12 Remove the fiber from the IN () port, of the OMON circuit pack that is connected to the OA.

- 13 Connect the optical power meter to the fiber just removed and obtain a power measurement.

**Important!** The power level will vary depending on the number of channels, path loss, C or L band.

- 14 Is the power level greater than -37 dBm?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 17. |
| <b>NO</b>  | Continue with Step 15. |

**Important!** The *WaveStar OLS 1.6T Installation Manual*, (365-575-717R6.2) accessible thorough the CIT Help section, provides assistance on routing the fiber jumper.

- 15 Using a new jumper, replace the fiber jumper between the OMON port of the OA and the IN () port of the OMON.

- 16 Obtain another **REPORTS - Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 17. |
| <b>NO</b>  | Continue with Step 28. |

- 17 Replace the OMON circuit pack. For details, go to "DLP-514: Remove and/or Install Circuit Pack" (14-30).

- 18 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 19. |
| <b>NO</b>  | Continue with Step 28. |

- 19 Remove the replacement circuit pack (installed in Step 17) and reinstall the original circuit pack. For details, go to "DLP-514: Remove and/or Install Circuit Pack" (14-30).

- 20 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Contact the appropriate maintenance support organization for further technical assistance. |
| <b>NO</b>  | Continue with Step 28.                                                                     |

**CAUTION**

*SERVICE AFFECTING - Step 21 could result in a service interruption.*

- 21 Notify the person for the optical line or channel associated with the service or protection signals assigned to this OA to:
- Manually switch the service line or channel to protection line or channel
  - Ensure all protection lines or channels assigned to this OA are not being used for service

- 22 Replace the OA circuit pack associated with the AID column of the failure report for this OMON circuit pack. For details, go to ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#).

- 23 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 24. |
| <b>NO</b>  | Continue with Step 26. |

- .....
- 24** Remove the replacement circuit pack (installed in Step 22) and reinstall the original circuit pack. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 25** Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the same failure condition still listed?

| IF...      | THEN...                                                                                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Contact the appropriate maintenance support organization for further technical assistance. Then continue with Step 26 if advised to restore service to the regular facilities. |
| <b>NO</b>  | Continue with Step 26.                                                                                                                                                         |

- .....
- 26** Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this optical multiplex section that the section can now be returned to service.
- .....

- 27** Perform a baseline on the OA circuit pack if it was replaced. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
- .....

- 28** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

END OF STEPS

.....



## TAP-192: Clear 'Local SUPVY DL Failure,' 'Express SUPVY DL Failure, or 'PROVDLTYPE Mismatch'

---

**Overview** This condition can be caused by a provisioned difference between the east and west sides of a data link when provisioned for either a Local or Express data link. Clicking on the help screen button below the alarm condition will provide details on provisioning the parameters. These alarm conditions can be caused by certain upstream failures such as SUPVY booting, BOS overhead controller booting, or various SUPVY failure conditions.

When provisioning the originating and terminating ends of an Express Data Link Termination - Provisionable, the originating and terminating nodes must be different. For example, a three-node system: the originating node could be local-user and the terminating node must be local-network. The intermediate node for the Data Link Termination - Provisionable would be provisioned for Express on the east and west sides of the node. If the originating and terminating nodes are the same, an Express SUPVY DL Failure alarm condition is generated. If the intermediate node is not the same on the East and West sides, a PROVDLTYPE Mismatch alarm condition is generated.

When provisioning the originating and terminating ends of a Local Data Link Termination - Fixed, the originating and terminating nodes must be different. For example, originating node could be local-user and the terminating node must be local-network. If they are the same, a Local SUPVY DL Failure alarm condition is generated.

**Procedure**      **Important!** Failures in the SUPVY channel will cause Express SUPVY DL **and** Local SUPVY DL Failures. **Before attempting to clear** Express SUPVY DL **or** Local SUPVY DL Failures, **all other SUPVY channel failures in the sub-network must be cleared first.**

---

- 1 At the CIT, from the NE Equipment Explorer, do the following:
  1. Click on the appropriate bay where the desired SUPVY circuit pack is installed.
  2. Click on the appropriate shelf.
  3. Click on SUPVY circuit pack

4. Click on the appropriate Line.
5. Select **CONFIGURATION-Equipment** from the Main menu.

- .....
- 2 Are the Data Link parameters provisioned per the office records?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 7. |
| <b>NO</b>  | Continue with Step 3. |

.....

- 3 From the office records, determine the correct Data Link provisioning parameters.
- .....

- 4 Provision the Data Link parameters to the correct parameter(s) per the office records and click the **Apply** button.
- .....

- 5 Wait up to 10 minutes for the SUPVY circuit pack to reboot.
- .....

- 6 At the CIT, select **REPORTS- Conditions** to obtain a report. Is the same alarm condition(s) still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 7.  |
| <b>NO</b>  | Continue with Step 21. |

.....

- 7 Initiate a Trouble Report to the next upstream Network Element and have them check for alarm conditions (SUPVY circuit pack failure, various SUPVY channel failure conditions, Data Link (DL) failures). Are there any alarm conditions at the upstream office?

| IF...      | THEN...                                                                                        |
|------------|------------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer Trouble Report to that office.<br><b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |
| <b>NO</b>  | Continue with Step 8.                                                                          |

.....

- .....
- 8 Have the upstream Network Element remove the SUPVY circuit pack. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 9 Have the upstream Network Element install a new SUPVY circuit pack with the same series number. For details, refer to “DLP-514: Remove and/or Install Circuit Pack” (14-30).
- .....

- 10 At the CIT, select **REPORTS - Conditions** to obtain a report. Is the same alarm condition(s) still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 11. |
| <b>NO</b>  | Continue with Step 20. |

.....

- 11 Have the upstream Network Element remove the circuit pack installed in Step 9. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 12 Have the upstream Network Element reinstall the original SUPVY circuit pack removed in Step 8. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 13 At the Network Element with the original alarm condition, remove the appropriate shelf cover for the SUPVY circuit pack. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 14 Remove the SUPVY circuit pack in the office with the original alarm condition. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 15 Replace the SUPVY circuit pack. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....



- .....
- 16** At the CIT, select **REPORTS- Conditions** to obtain a report. Is the same alarm condition(s) still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 17. |
| <b>NO</b>  | Continue with Step 20. |

.....

- 17** Remove the SUPVY circuit pack installed in Step 15. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 18** Reinstall the original circuit pack removed in Step 14. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 19** Contact the appropriate maintenance support organization for further technical assistance.
- .....

- 20** Baseline the replaced circuit pack(s). For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
- .....

- 21** Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

.....

END OF STEPS

.....



# TAP-193: Clear 'Invalid Primary DSA Address'

**Overview** The network element provisioned to act as a Registration Manager can not build a valid address to the Primary Directory Service Agent (DSA) which is located at the Operations Support Center.

## Procedure

**1** At the CIT, select the **CONFIGURATION-Data Communications menu**.

**2** In the **CONFIGURATION-Data Communications** dialog box, the **Network Layer** tab appears.

**Important!** Depending on records in SNMS and the system administrator, you may have to verify the primary address under the DSA NSAP tab as well.

**3** Verify with the local office records or the system administrator at the operations support center if the same NSAP address and primary directory server agent address is correct. Also verify all secondary addresses, if required.

**4** If changes are required, click on the **Modify** button for the appropriate field and enter the correct address information.

**5** Click on **OK**. The changed information appears in the appropriate field of the dialog box.

**6** Is the Invalid Primary DSA Address alarm condition still listed?

| IF...      | THEN...                                         |
|------------|-------------------------------------------------|
| <b>YES</b> | Continue with Step 7.                           |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |

- 
- 7** Initiate a Trouble Report to the responsible Operations Support Center or System Administrator stating an Invalid Primary DSA Address trouble condition is still being reported by this network element.

END OF STEPS

---



## TAP-194: Clear 'RM Unreachable'

---

**Overview** The RM Unreachable condition indicates a network element has waited five minutes and has not received a Registration Request Protocol (RRP) request from the Registration Manager. This condition could be caused by a provisioning change in the Registration Manager network element, an upstream BOS controller failure, or supervisory data link failure. As a result of this condition, SNMS (or other Element Management System) may not be able to communicate with the downstream networks elements.

**Important!** The RM Unreachable alarm can be suppressed by using the ASAP feature to change the alarm severity to NI, No\_Indication. This alarm will be generated by the NE when the SNMS is not used to manage the network and this alarm should be suppressed as stated above. Note that using NI to suppress this condition will suppress all indications of the condition. If the network is being managed by the SNMS, the RM Unreachable alarm can be suppressed by using ASAP feature to change the alarm severity to NR, No Report. The NE needs to be reset in order to clear the RM Unreachable alarm following the ASAP provisioning.

### Procedure

---

- 1 Determine from office records which network element is designated the 'Registration Manager'.

---

- 2 Initiate a login session with the network element identified in Step 1. A remote login session may fail depending on the state of the network element. Therefore, obtain local assistance at the Registration Manager network element to connect the CIT at that location.

---

- 3 At the CIT, select **REPORTS - Conditions** to obtain the alarms/conditions at the network element.

---

- 4 Is there a BOS-OHCTL failure listed?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Go to Step 5.         |
| <b>NO</b>  | Continue with Step 7. |

- 
- 5** At the CIT, select **FAULT-Reset** and in the Reset Dialog box select **System** and click the **OK** button to reset the network element.
- 
- 6** If SNMS (or other Element Management System) can communicate with all of the downstream network elements, then the RM Unreachable condition has been cleared. If not proceed to Step 7.
- 
- 7** At the CIT select **CONFIGURATION-Data Communications-DSA OSI Stack Selector**.
- 
- 8** If the network element(s) identified in Step 1 are not provisioned as Registration Manager proceed to Step 9. Otherwise, proceed to Step 10.
- 
- 9** In the DSA OSI Stack Selector dialog box, provision the Registration Manager to **Enabled**.
- 
- 10** Determine from office records the correct Primary and Secondary DSA network addresses, Primary and Secondary TSB network addresses, and Directory Name Prefix. If the preceding information is incorrect, continue to Step 11. If the information is correct, proceed to Step 13.
- 
- 11** At the CIT, select **ADMINISTRATION-Data Communications-DSA NSAP** and provision the Primary and Secondary DSA network addresses. From the Data Communications window, select the **TSB** tab and provision the Primary and Secondary TSB network addresses. From the Data Communications window, select the **DSA Name Prefix** tab and provision the DSA Name Prefix.
-

- 
- 12** If SNMS (or other Element Management System) can communicate with all of the downstream network elements, then the RM Unreachable condition has been cleared. If the EMS still cannot communicate with the downstream network elements, proceed to Step 13.
- 
- 13** At the CIT, select **REPORTS- Conditions** to obtain the alarms/conditions at the network element.
- 
- 14** If there are supervisory and/or optical line conditions listed, refer to [“TAP-110: Address Incoming Signal Failure” \(13-26\)](#), [“TAP-178: Clear SUPVY Add Input LOS” \(13-118\)](#), [“TAP-181: Clear 'SUPVY Drop Output LOS'” \(13-126\)](#), and [“TAP-192: Clear 'Local SUPVY DL Failure,' 'Express SUPVY DL Failure, or 'PROVDLTYPE Mismatch'” \(13-148\)](#) of this manual. If not, proceed to Step 16.
- 
- 15** If SNMS (or other Element Management System) can communicate with all of the downstream network elements, then the RM Unreachable condition has been cleared. If the EMS still cannot communicate with the downstream network elements, proceed to Step 16.
- 
- 16** Determine from office records the correct IP address for the network elements which are designated as the Primary and Secondary transport bridges. Establish a login session with those network elements (the network element which is designated the Registration Manager is not necessarily the transport bridge) if one does not already exist. At the CIT select **CONFIGURATION-Data Communications-TCP/IP**. If the IP addresses of the transport bridges are not provisioned continue to Step 17. Otherwise, proceed to Step 19.
- 
- 17** In the CONFIGURATION-Data Communications-TCP/IP dialog box, enter the predetermined IP addresses for the network elements designated as the Primary and Secondary transport bridges.

- .....
- 18** If SNMS (or other Element Management System) can communicate with all of the downstream network elements, then the RM Unreachable condition has been cleared. If the EMS still cannot communicate with the downstream network elements, proceed to Step 19.
- .....

**Important!** Use the following steps for troubleshooting the RM Unreachable condition in network elements downstream of the Registration Manager network element.

- 19** Identify all networks which are not communicating with SNMS (or other Element Management System).
- .....
- 20** Initiate a login session with the network element identified in Step 19. A remote login session may fail depending on the state of the network element. Therefore, obtain local assistance at the network element to connect the CIT at that location. For details, refer to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- .....
- 21** At the CIT, select **REPORTS - Conditions** to obtain the alarms/conditions at the network element.
- .....
- 22** If there is a BOS-OHCTL failure (or BOS-SYSCTL for repeaters) listed, continue to Step 23. If not, proceed to Step 25.
- .....
- 23** At the CIT, select **FAULT-Reset** and in the Reset Dialog box select **System** and click the **OK** button to reset the network element.
- .....
- 24** If SNMS (or other Element Management System) can communicate with all of the downstream network elements, then the RM Unreachable condition has been cleared. If not proceed to Step 25.
- .....
- 25** The network element identified in Step 19 should not be provisioned as Registration Manager. At the CIT select **CONFIGURATION-Data**

**Communications-DSA OSI Stack Selector**, verify the Registration Manager is disabled. If the network element is provisioned as a Registration Manager continue to Step 26. If not, proceed to Step 28

**Important!** When the Registration Manager is disabled, the BOS Bay Controller will reboot. Topology construction alarms will appear.

- 26** From the DSA OSI Stack Selector dialog box, provision the Registration Manager to **Disabled**.
- 27** If SNMS (or other Element Management System) can communicate with all of the downstream network elements, then the RM Unreachable condition has been cleared. If the EMS still cannot communicate with the downstream network elements, proceed to Step 28.
- 28** At the CIT, select **REPORTS - Conditions** to obtain the alarms/conditions at the network element. If there is are supervisory and/or optical line conditions listed, refer to [“TAP-110: Address Incoming Signal Failure” \(13-26\)](#), [“TAP-178: Clear SUPVY Add Input LOS” \(13-118\)](#), [“TAP-181: Clear 'SUPVY Drop Output LOS'” \(13-126\)](#), and [“TAP-192: Clear 'Local SUPVY DL Failure,' 'Express SUPVY DL Failure, or 'PROVDLTYPE Mismatch'” \(13-148\)](#) of this manual.
- 29** If SNMS (or other Element Management System) can communicate with all of the downstream network elements, then the RM Unreachable condition has been cleared. If the EMS still cannot communicate with other downstream network elements, repeat Step 19 through Step 28 until all downstream network elements are communicating with the Element Management System. If the Element Management System cannot communicate with the network elements upon completion of this procedure, consult Lucent Technologies Technical Support.

END OF STEPS





## TAP-195 Clear 'DSA Unreachable'

---

**Overview** The network element has been unsuccessful in an attempt to register with a Directory Service Agent (DSA) using the data provided by a Registration Manager via a Registration Request Protocol (RRP) request.

**Important!** The DSA Unreachable alarm can be suppressed by using the ASAP feature to change the alarm severity to NR, No Report.

### Procedure

---

- 1 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, see [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- 2 Make an inspection of the Operation Support (OS) RJ45 cable connected to the J32 OS connector at the interconnect panel. Verify that the RJ45 cable is properly seated in the RJ32 connector and adapter.
- 3 Is the RJ45 cable connected properly to the J32 (OS) jack and adapter in Step 2?

| IF...      | THEN...                                          |
|------------|--------------------------------------------------|
| <b>YES</b> | Continue with Step 4.                            |
| <b>NO</b>  | Connect the RJ45 cable and continue with Step 4. |

---

- 4 At the CIT, select **REPORTS- Conditions** to obtain a report.
- 5 Referring to the report obtained in Step 4, is the DSA Unreachable alarm condition still present?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 6. |

| IF...     | THEN...                                                |
|-----------|--------------------------------------------------------|
| <b>NO</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

- 6 Reinstall the shelf cover. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

**Important!** The Network Element provisioned to act as the Registration Manager can not build a valid address to the Primary Directory Service Agent (DSA).

- 7 At the CIT, select the **CONFIGURATION-Data Communications** menu.

- 8 In the **CONFIGURATION-Data Communications** dialog box, the Network Layer tab appears.

**Important!** Depending on records in SNMS and the system administrator, you may have to verify the primary address under the DSA NSAP tab as well.

- 9 Verify with local office records or the system administrator at the Operations Support center if the NSAP address and primary directory server agent address is correct. Also, verify all secondary addresses if required.

- 10 If changes are required, click **Modify** for the appropriate field and enter the correct address information.

- 11 Click **OK**. The changed information appears in the appropriate field of the dialog box.

- 12 At the CIT, click on **REPORTS- Conditions** to obtain another report.

- 13 Is the DSA Unreachable alarm condition still listed?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | Continue with Step 14.                                 |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

- .....
- 14** Initiate a Trouble Report to the responsible Operations Support Center or System Administrator stating a DSA Unreachable alarm condition is still being reported by this network element.

END OF STEPS

.....



## TAP-197: Clear 'WaveWrapper Path Trace Mismatch'

---

**Overview** This procedure is used to clear the WaveWrapper Path Trace Mismatch condition. The WaveStar® OLS 1.6T reads the optical channel path trace byte (0J3) in the optical channel overhead. This condition indicates that the incoming optical channel path trace message trace does not match the expected incoming optical channel path trace message trace.

### Procedure

---

- 1 At the CIT, select **FAULT-Analysis-Optical Channel Path Trace** and select appropriate bay shelf and OTU port to obtain a report.
- 

- 2 Determine from the local office records what is the correct expected received OCH path trace message for this OC-192.
- 

- 3 Do the office records for the expected incoming optical channel path trace message match the data in the expected incoming optical channel path trace message listed in the report from Step 1?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 4.  |
| <b>NO</b>  | Continue with Step 11. |

---

- 4 At the CIT, select **REPORTS- Conditions** to obtain an updated report.
- 



### CAUTION

*SERVICE AFFECTING - Step 5 could result in service interruption.*

- 5 Trace the fiber jumper connected to the IN port of the OTU (OTU30, OTU31, or OTUD30), identified in the AID column, back to the source.

- .....
- 6 Do the office records indicate that the fiber jumper is connected to the correct source?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 14. |
| <b>NO</b>  | Continue with Step 7.  |

.....



**CAUTION**

***SERVICE AFFECTING*** - Step 7 could result in service interruption.

- 7 Using local procedures connect the fiber jumper to the correct source.
- .....

- 8 At the CIT, select **REPORTS- Conditions** to obtain an updated report.
- .....

- 9 Is the WaveWrapper Path Trace Mismatch condition still present?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 14. |
| <b>NO</b>  | Continue with Step 10. |

.....

- 10 ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***
- .....

- 11 At the CIT, select **FAULT-Analysis-Optical Channel Path Trace** and enter the correct expected incoming optical channel path trace message.
- .....

- 12 At the CIT, select **REPORTS- Conditions** to obtain an updated report.

- .....
- 13** Is the WaveWrapper Path Trace Mismatch condition still present?

| IF...      | THEN...                                                                          |
|------------|----------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                           |

.....

**Important!** At this point, it appears that the local network element is operating correctly.

- 14** Initiate a Trouble Report to the upstream network element of the line indicating the WaveWrapper Path Trace Mismatch.

END OF STEPS

.....



## TAP-202: Clear 'WAD Add LOS'

---

**Overview** The power detector at the ADD IN port of this WAD circuit pack has detected a loss of signal.

**Important!** For WAD Type 2 only, first check to see if the 'WAD Drop LOS' alarm is standing. If so, go to TAP-180 and follow the procedure to clear the alarm. After completing the steps in TAP-180, check to see if the 'WAD Add LOS' alarm is still standing. If the 'WAD Add LOS' remains after completion of the steps in TAP-180, then follow the steps listed below to clear the alarm.

### Procedure

---

- 1 At the CIT, select **REPORTS - Conditions** to obtain a report.
  - 2 Identify the circuit pack associated with this failure condition; use the AID column from the report in Step 1.
- 

- 3 Does a "WAD Drop LOS" condition appear in the report?

| IF...      | THEN...                                                                                           |
|------------|---------------------------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">"TAP-180: Clear 'WAD Drop Channel LOS' " (13-124)</a> and clear that condition. |
| <b>NO</b>  | Continue with Step 4.                                                                             |

---

- 4 Remove the appropriate shelf cover. For details, refer to ["DLP-511: Install/Remove Shelf Cover" \(14-20\)](#).
- 5 Identify the upstream circuit pack to which this WAD ADD IN Port is connected. Use the bay, shelf, slot, ADD\_IN port listed in the AID column of the report for this WAD circuit pack and the fiber routing information found in the Fiber Management for WAD Terminals section of the *WaveStar® OLS 1.6T Installation Manual*, (365-575-717R6.2).

**CAUTION**

***SERVICE AFFECTING*** - Step 5 could result in service interruption

- 6 Visually inspect the fiber jumper connected to the ADD IN port of the WAD circuit pack and the upstream circuit pack identified in Step 4. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- 7 Did the visual inspection result in correcting any problems?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 7. |
| <b>NO</b>  | Continue with Step 8. |

- 8 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the WAD ADD LOS failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 8.  |
| <b>NO</b>  | Continue with Step 19. |

- 9 Replace the fiber jumper between the upstream circuit pack and the WAD ADD IN port reporting the failure condition. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- 10 Obtain another **REPORTS- Conditions** report (refer to Step 1). Is the WAD ADD LOS failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 10. |
| <b>NO</b>  | Continue with Step 19. |



- .....
- 11** Replace the upstream circuit pack identified in Step 4. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 12** Obtain another **REPORTS - Conditions** report (refer to Step 1). Is the WAD ADD LOS failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 12. |
| <b>NO</b>  | Continue with Step 19. |

.....

- 13** Remove the replacement circuit pack (installed in Step 10) and install the original circuit pack. For details, go to “DLP-514: Remove and/or Install Circuit Pack” (14-30).
- .....

- 14** Obtain another **REPORTS - Conditions** report (refer to Step 1). Is the WAD ADD LOS failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 14. |
| <b>NO</b>  | Continue with Step 19. |

.....

- 15** Replace the WAD circuit pack identified with this failure condition in Step 1. For details, go to “DLP-514: Remove and/or Install Circuit Pack” (14-30).
- .....

- 16** Obtain another **REPORTS - Conditions** report (refer to Step 1). Is the WAD ADD LOS failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 16. |
| <b>NO</b>  | Continue with Step 19. |

- .....
- 17** Remove the replacement circuit pack (installed in Step 14) and install the original circuit pack. For details, go to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....
- 18** Contact the appropriate maintenance support organization for further technical assistance.
- .....
- 19** STOP! YOU HAVE COMPLETED THIS PROCEDURE.
- .....
- 20** Reinstall the shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....
- 21** Is the CR/PROMPT, MJ/DEFERRED or MN LED lighted on the EI circuit pack/User Panel.

| IF...      | THEN...                                                                                   |
|------------|-------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> . |
| <b>NO</b>  | STOP! YOU HAVE COMPLETED THIS PROCEDURE.                                                  |

END OF STEPS

.....



## TAP-207: Clear 'Unexpected Channel'

---

**Overview** If a fiber connection is made, and a signal is applied, between external equipment and an OMU or a WAD without an External ADD association, an `Unexpected Channel` alarm condition will be raised at that node. The alarm condition will be cleared when the External ADD association is created for that fiber connection, or when the signal is removed from the fiber.

### Procedure

---

- 1 At the CIT, select **REPORTS - Conditions** to obtain an updated report.  
.....
- 2 Using the channel designator in the AID column, determine from the local office records if an association should be made to the external equipment or if a signal should be removed from the fiber connected to the OMU or WAD port.  
.....
- 3 Make the proper association using the Circuit Connection Configuration Wizard or signal correction per local office records.  
.....
- 4 Did the alarm clear?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

END OF STEPS

---



## TAP-210: Clear 'Optical Channel Transmit Failure'

**Overview** This condition indicates that the OMON circuit pack has detected a loss of an optical channel incoming to the transmit OA circuit pack.

### Procedure

- 1 At the CIT, select **REPORTS - Conditions** to obtain a report.
- 2 Are all optical channels indicating an optical channel transmit failure?

| IF...      | THEN...                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Proceed to <a href="#">“TAP-212: Clear 'DCM Failure' and/or Isolate Defective DCM Connections” (13-179)</a> . |
| <b>NO</b>  | Continue with Step 3.                                                                                         |

- 3 Using the AID column from the report (Step 1) identify the port label number associated with the condition (for example, it is 9190 for OCHAN-1E-9190).
- 4 From the NE Equipment Explorer dialog box, select Bay 1.
- 5 From the menu, select the **REPORTS - Port Association** List.
- 6 Click on **Select**.
- 7 Using the port label number obtained in Step 3 (9190) and the information in the source port AID column of the report (for example, port-1-1-1-OUTA\_9190 and port 1-3-5-9190), determine the slot and port location of the OTU and the OMU/WAD circuit pack. If the port label is not found in the source port AID column, repeat Step 5 through Step 7 for Bay 2.
- 8 Remove the appropriate shelf cover from the front. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).



## CAUTION

***SERVICE AFFECTING** - Step 9 could result in service interruption*

- 9 Visually inspect the incoming signal cable between the OTU OUT port connector and the OMU/WAD IN () port connector and correct any problems found. For details, refer to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).
- 

- 10 Did the visual inspection result in correcting any problems?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 11. |
| <b>NO</b>  | Continue with Step 12. |

---

- 11 Obtain another **REPORTS - Conditions** report (refer to Step 1). Is the optical channel transmit failure still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 12. |
| <b>NO</b>  | Continue with Step 30. |

---

- 12 Using the information from the report (Step 7) identify the OTU and OTU OUT() fiber connected to the OMU/WAD IN() port associated with the alarm condition.
- 



## CAUTION

***SERVICE AFFECTING** - Failure to follow the instructions in Step 14 could result in service interruptions.*

- 13** Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this OTU to:

- Manually switch the service line or channel to a protection line
- Ensure the protection line or channel assigned to this OTU is not being used for service

- 14** Remove and clean the fiber identified in Step 12 at the OMU/WAD IN port. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- 15** Connect an optical power meter to the fiber cleaned in Step 14 and obtain power measurement.

**RESULT:** The power should be -5 dBm +/-0.5 dBm.

- 16** Was the optical power measurement within the limits?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 23. |
| <b>NO</b>  | Continue with Step 17. |

- 17** Is LBO installed on the OTU?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 18. |
| <b>NO</b>  | Continue with Step 20. |

- 18** Select a new LBO with the same dB value, clean and replace existing LBO in the OUT port of the OTU.

- 19** Obtain another report (refer to Step 1). Is the Optical Channel Transmit still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 20. |

| IF... | THEN...                |
|-------|------------------------|
| NO    | Continue with Step 29. |

- 20 Replace the OTU circuit pack identified in Step 12. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 21 Obtain another report (refer to Step 1). Is the same alarm condition still listed?

| IF... | THEN...                |
|-------|------------------------|
| YES   | Continue with Step 22. |
| NO    | Continue with Step 29. |

- 22 Remove the replacement circuit pack (installed in Step 20) and reinstall the original circuit pack. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

**Important!** At this point, suspect the OMU/WAD is defective.



## CAUTION

*Failure to follow instructions in this step could result in service interruptions. Contact the appropriate maintenance support organization for further technical assistance if required.*

- 23 Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this OMU/WAD to:
- Manually switch the service line or channel to a protection line
  - Ensure the protection line or channel assigned to this OMU/WAD is not being used for service

- 24 Replace the OMU/WAD pack identified in Step 7 For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- .....
- 25** Obtain another report (refer to Step 1). Is the same Optical Channel Transmit failure listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 26. |
| <b>NO</b>  | Continue with Step 28. |

- .....
- 26** Contact the appropriate maintenance support organization for further technical assistance.

- .....
- 27** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***

- .....
- 28** Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this OMU/OTU/WAD that the optical channel or optical line can now be returned to service.

- .....
- 29** Baseline the replaced circuit pack. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).

- .....
- 30** Reinstall the shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- .....
- 31** **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

.....

END OF STEPS





## TAP-211: Clear 'Clamping Transmit OA to Output O-Channel Power'

---

**Overview** This condition indicates that the transmit (toward the line) OA output power is reduced by a minimum of 10 dB from the normal output power of the transmit OA for this span. This clamping condition on the transmit OA is normally implemented by the installation personnel or the appropriate maintenance organization to create a safe OA output power to measure span loss or debugging a system that is not yet carrying service or the Clamping Transmit OA to Output O-Channel Power state has a higher priority regardless if there is an APSD condition active or not.



### CAUTION

*SERVICE AFFECTING - The CIT command that created this Clamping Transmit OA to Output O-channel Power alarm condition should only be performed during installation of a new system or when service on the working system has been rerouted.*

**Important!** Please ignore the Clamping Transmit OA to Output O-channel Power **where there is an "OA Removed Standing Condition."**

**Procedure** To determine the cause of the transmission errors:

---

- 1 At the CIT, select **REPORTS - Conditions** to obtain a report.  

---
- 2 Using the AID and Description columns from the report, identify the appropriate **transmit** OA associated with the clamping alarm condition.  

---
- 3 Consult the on-site installation or maintenance personnel or the operations center to determine why clamping of the **transmit** OA was implemented for this location.

- 4 Should the OA output be clamped?

| IF...      | THEN...                                                                                                                                                           |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | STOP! YOU HAVE COMPLETED THIS PROCEDURE. This network element installation personnel, maintenance personnel or the alarm center should be aware of this activity. |
| <b>NO</b>  | Continue with Step 5.                                                                                                                                             |

- 5 At the CIT, click on **CONFIGURATION-Provision**.

- 6 Click on the bay where the **transmit** OA is located, identified in Step 2

- 7 Click on the shelf where the **transmit** OA is located, identified in Step 2.

- 8 Click on the optical line associated with the **transmit** OA circuit pack identified in Step 2.

- 9 Click on the **Provision** button.

- 10 Select **OFF** for the clamping to be removed.

- 11 Click on the **Apply** button.

- 12 At the CIT, select **REPORTS - Conditions** to obtain another report.

- 13 Is the same alarm condition still listed under the Description column of the report?

| IF...      | THEN...                                                                                            |
|------------|----------------------------------------------------------------------------------------------------|
| <b>YES</b> | Consult the appropriate installation or maintenance support organization for technical assistance. |
| <b>NO</b>  | Continue with Step 14.                                                                             |

**Important!** Once the transmit OA is cleared of the **Clamping Transmit OA to Output O-Channel Power** alarm condition, a manual trigger of APSD (by disconnecting fiber) and then restore fiber is required to bring the transmit OA to normal operational mode. The system needs a hard trigger to perform the OA-to-OA mismatch check.

- 14** Using the AID and Description columns from the report in Step 2, identify the **transmit** OA circuit pack associated with the original clamping alarm condition.

- 15** Temporarily remove the fiber from the IN port of the **transmit** OA listed in the AID column from Step 2.

- 16** At the CIT, select **REPORTS - Conditions** to obtain another report.

- 17** Is an APSD Active-Line listed under the Description column of the report.

| IF...      | THEN...                                                                                            |
|------------|----------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 18.                                                                             |
| <b>NO</b>  | Consult the appropriate installation or maintenance support organization for technical assistance. |

- 18** Reconnect the fiber removed in Step 15 to the IN port of the **transmit** OA.

- 19** At the CIT, select **REPORTS - Conditions** to obtain another report.

.....

**20** Is an APSD Active-Line listed under the Description column of the report.

| IF... | THEN...                                                                                            |
|-------|----------------------------------------------------------------------------------------------------|
| YES   | Consult the appropriate installation or maintenance support organization for technical assistance. |
| NO    | Continue with Step 21.                                                                             |

.....

**21** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS

.....



## TAP-212: Clear 'DCM Failure' and/or Isolate Defective DCM Connections

---

**Overview** Defective DCM connections can cause transmission errors on multiple channels or loss of signal (LOS) at the DCM-In port of the OA.

**Important!** When clearing a DCM Failure alarm condition, the DCM apparatus unit has no LED. If the cause of the DCM Failure alarm condition is a bad DCM fiber jumper, bad LBO, or failed DCM apparatus unit for the DCM IN/OUT port of an OA, then the fault LED of the OA associated with the DCM failure will flash. The NE Alarm List AID column will identify the OA and the DCM IN port. Use the following procedure to isolate defective DCM connections.

### Determine Appropriate Section

Are you working on Transmission Errors or DCM Failures?

| IF...                                                   | THEN...                                                                                 |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Transmission Errors                                     | Continue with Step 1 of the section <b>Transmission Errors</b> later in this procedure. |
| DCM Failures/Multiple Optical Channel Transmit Failures | Continue with Step 1 of the section <b>DCM Failures</b> later in this procedure.        |

### Transmission Errors

Follow these steps to determine the cause of the transmission errors:

---

**Important!** End-to-end communication must be operational to perform this procedure.

- 1 Remotely log on to the head-end WaveStar® OLS 1.6T node of the line on which the errors are occurring. For details, go to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
  - 2 Are more than 8 channels are installed on this line?
-

| IF...      | THEN...            |
|------------|--------------------|
| <b>YES</b> | Proceed to Step 5  |
| <b>NO</b>  | Proceed to Step 3. |

.....

**3** Contact your next level of technical support.

.....

**4** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE!***

.....

**5** From the NE Equipment Explorer on the CIT, select bay, shelf, OA and optical line, then right-click to read Tilt\_Error for the suspected Oline.

.....

**6** Is the Tilt\_Error is greater than +2 or less than -2

| IF...      | THEN...                                                                                                                            |
|------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Then conclude that there is a problem at this node.<br>Travel to the identified node and proceed with Step 9 to clear the problem. |
| <b>NO</b>  | Continue with Step 7.                                                                                                              |

.....

**7** Remotely log on to the next downstream WaveStar® OLS 1.6T node and repeat Step 5 and Step 6 until all nodes have been queried. For details, go to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#). If unable to locate a node with an out-of-range reading, consult the appropriate installation or maintenance support organization for technical assistance.

.....

**8** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE!***



## CAUTION

*SERVICE AFFECTING: The following steps will cause interruption of traffic.*

- 9 Disconnect the fiber at the DCM-Out port of the OA.
- 10 Remove the LBO at the DCM-Out port and replace it with a 0-dB LBO
  - Measure the power at the DCM-Out port
  - Record this power as DCM\_OUT
  - Re-insert the original LBO at the DCM-Out port.
- 11 Clean the fiber and reconnect it to the DCM-Out port.
- 12 Disconnect the fiber at the DCM-In port
  - Measure the power at the output of the this fiber (that was connected to the DCM-In port)
  - Record this power as DCM\_IN.
- 13 Clean the fiber and reconnect it to the DCM In port of the OA.
- 14 Calculate the measured  $DCM\_LOS = DCM\_OUT - DCM\_IN$ .

| IF...                                  | THEN...                |
|----------------------------------------|------------------------|
| DCM_LOS is less than or equal to 10 dB | Continue with Step 15. |
| DCM_LOS is greater than 10 dB          | Continue with Step 16. |

- 
- 15** If DCM\_LOS is less than or equal to 10 dB and the transmission errors have not stopped:
- Then replace the OA circuit pack by following the OA installation procedure [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
  - If transmission errors persist, contact the appropriate maintenance support organization for technical assistance.
  - ***STOP! YOU HAVE COMPLETED THIS PROCEDURE!***
- 
- 16** If the DCM\_LOS is greater than 10 dB, then the conclusion is there is a problem with the DCM connections at this node
- Clean the fibers and replace the LBO on the DCM\_OUT port with an LBO of equal value
  - Re-measure DCM\_LOS and repeat Step 9 to Step 14.
- 
- 17** If DCM\_LOS is still greater than 10 dB
- Replace the fibers that connect the DCM to the OA
  - Re-measure DCM\_LOS and repeat Step 9 to Step 14.
- 
- 18** If DCM\_LOS is still greater than 10 dB
- Replace the DCM. For details refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
  - Install a new LBO by following the DCM LBO installation procedure. Refer to [“DLP-530: DCM LBO Procedure” \(14-86\)](#) for detailed procedures.
  - If transmission errors persist, contact the appropriate maintenance support organization for technical assistance.
  - ***STOP! YOU HAVE COMPLETED THIS PROCEDURE!***
- END OF STEPS
-



**DCM Failure** Follow these steps to determine the cause of the LOS at the DCM-In Port of the OA:

.....



**CAUTION**

*SERVICE AFFECTING - The following steps will cause interruption of traffic.*

- 1** Disconnect the fiber at the DCM-Out port of the OA.  
.....
- 2** Remove the LBO at the DCM-Out port and replace it with a 0-dB LBO
  - Measure the power at the DCM-Out port
  - Record this power as DCM\_OUT
  - Re-insert the original LBO at the DCM-Out port......
- 3** Clean the fiber and reconnect it to the DCM-Out port.  
.....
- 4** Disconnect the fiber at the DCM-In port
  - Measure the power at the output of the this fiber (that was connected to the DCM-In port)
  - Record this power as DCM\_IN......
- 5** Clean the fiber and reconnect it to the DCM In port of the OA.  
.....
- 6** Determine the measured  $DCM\_LOS = DCM\_OUT - DCM\_IN$ .

- .....
- 7 If DCM\_LOS is less than or equal to 10 dB and the transmission errors have not stopped:
- Then replace the OA circuit pack by following the OA installation procedure [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
  - If alarm persists for more than 30 minutes, contact the appropriate maintenance support organization for technical assistance.
  - **STOP! YOU HAVE COMPLETED THIS PROCEDURE!**
- .....
- 8 If the DCM\_LOS is greater than 10 dB, then the conclusion is there is a problem with the DCM connections:
- Clean the fibers and replace the LBO on the DCM\_OUT port with an LBO of equal value
  - Re-measure DCM\_LOS; and repeat Step1 to Step 6.
- .....
- 9 If DCM\_LOS is still greater than 10 dB:
- Replace the fibers that connect the DCM to the OA
  - Re-measure DCM\_LOS, and repeat Step 1 to Step 6.
- .....
- 10 If DCM\_LOS is still greater than 10 dB:
- Replace the DCM, for details refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#)
  - Install a new LBO in place of the original LBO in the DCM out port of the OA. Refer to [“DLP-530: DCM LBO Procedure” \(14-86\)](#) for detailed procedures.
  - If alarm persists for more than 30 minutes, contact the appropriate maintenance support organization for technical assistance.
  - **STOP! YOU HAVE COMPLETED THIS PROCEDURE!**

END OF STEPS



## TAP 213: Clear TCA Optics 'OLINE (TOPR-OL)'

---

**Overview** The total optical receive power at the OA has either exceeded the high threshold or has dropped below the low threshold.

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

Make sure all TCAs have a default threshold value. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may clear the TCA at the other downstream nodes.

### Display the Default Threshold

The following is the procedure for displaying the default threshold:

---

- 1 From the NE Equipment Explorer, select the bay, shelf and slot/CP number.

---

- 2 Click on **Line () (Optical Line)**

---

- 3 From the Main menu, select **PERFORMANCE-Provision Threshold**.  
**Important!** It can take as much as 10 minutes for a TCA to activate or clear.

---

- 4 Before taking the recommended action that follows, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value.

END OF STEPS

---

**Recommended Action** Follow these steps to clear the condition TCA Optics: 'OLINE (TOPR-OL).



## CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 2 could result in service interruption.*

- 1 Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this OA to perform one of the following actions:
  1. Manually switch the service line or channel to a protection line
  2. Ensure all protection lines or channels assigned to this OA are not being used for service
  3. Restore service on a different Optical Line System or route.

- 2 If the TCA is occurring on all nodes, were channels added or deleted?

| If... | Then...                                                                                                                                                                                                            |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes   | Manually re-baseline each node. Refer to <a href="#">“DLP-529: Baseline Optical Parameters ” (14-74)</a> . If problem persists, contact the appropriate maintenance support organization for technical assistance. |
| No    | Continue with Step 3.                                                                                                                                                                                              |

- 3 Measure span loss between the node that has the TCA and the upstream node. If span loss has changed per office records:
  - Determine the reason
  - Rectify the problem
  - Manually re-baseline this node, if necessary. Refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
  - If problem persists contact the appropriate maintenance support organization for technical assistance.

- 
- 4 Notify the person responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

END OF STEPS

---



# TAP 214: Clear TCA Optics 'OLINE (TOPT-OL)'

**Overview** The total optical transmit power at the OA has either exceeded the high threshold or has dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Display the Default Threshold** The following is the procedure for displaying the default threshold:

- 1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number
- 2 Click on **Line () (Optical Line)**
- 3 From the Main menu, select **PERFORMANCE-Provision Threshold**.  
**Important!** It can take as much as 10 minutes for a TCA to activate or clear.
- 4 Before taking the recommended action, check the sensitivity of the current user-provisioned thresholds that can cause inadvertent activation of TCAs, and, may only require adjusting the current threshold value.

END OF STEPS

**Recommended Action** Follow these steps to clear the condition TCA Optics: OLINE  
(TOPT-OL):

.....



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in  
Step 2 could result in service interruption.*

- 1** Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this OA to perform one of the following actions:
  1. Manually switch the service line or channel to a protection line
  2. Ensure all protection lines assigned to this OA are not being used for service
  3. Restore service on a different Optical Line System or route.

.....
- 2** If power is per Table 7-11, Optical Amplifier Output Power for Channel Counts from 1 to 80 Channels (All OTU Types), in the Technical Specifications chapter of the *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), then
  1. Manually re-baseline this node, and
  2. If problem persists, escalate to next maintenance level.
  3. STOP! YOU HAVE COMPLETED THIS PROCEDURE.

.....
- 3** If power is **not** per Table 7-11, Optical Amplifier Output Power for Channel Counts from 1 to 80 Channels (All OTU Types), in the Technical Specifications chapter of the *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), then
  1. Replace OMON and then OA.
  2. If problem persists contact the appropriate maintenance support organization for technical assistance.
  3. STOP! YOU HAVE COMPLETETED THIS PROCEDURE.  
Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

END OF STEPS

.....



# TAP-215: Clear 'TCA Optics OCHAN (SPR-C)'

**Overview** The signal power received for a specific optical channel has either exceeded the high threshold or has dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Display the Default Threshold** The following is the procedure for displaying the default threshold:

- 1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number.
- 2 Click on **OCHAN-( )e/w-( )**.
- 3 From the Main menu, select **PERFORMANCE-Provision Threshold**.  
**Important!** It can take as much as 10 minutes for a TCA to activate or clear.
- 4 Before taking the recommended action, check the sensitivity of the current user-provisioned thresholds that can cause inadvertent activation of TCAs, and only require adjusting the current threshold value.

END OF STEPS



**Recommended Action for  
one or a few channels**

Using the CIT, read the receive (OCHAN) power of the specified channel wavelength at the OA.

---

- 1 If the current value is per measurements found in the table at the end of the steps in [“DLP-524: Connect Optical Power Meter for Measurement at OTU \(\) IN \(\) Port” \(14-51\)](#), manually baseline the specific channel. Refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
    1. If TCA does not clear within approximately 10 minutes, contact the appropriate maintenance support organization for technical assistance.
    2. STOP! YOU HAVE COMPLETED THIS PROCEDURE.
- 



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 2 could result in service interruption.*

- 2 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 
- 3 If the current value is per measurements in [“DLP-528: LBO Application” \(14-59\)](#), then
    1. Using a power meter, disconnect the fiber and measure the power at the corresponding output port (including LBOs in the path) of the add OTU upstream.
      - a. If the power is **out of range** per WaveStar® OLS 1.6T Applications Planning Guide, (365-575-713R6.2), Technical Specifications, replace the LBO at the output port and/or add OTU circuit pack.

**NOTE:** If the OTU circuit pack is replaced, manually baseline both ports. Refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).

- b. If the power **is** per Table 7-11 of *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), Technical Specifications, continue with Step c.
        - c. Record the power of the OTU output port.
      2. Disconnect the fiber from the input port associated with the OCHAN of OMU( ), connect it to a power meter and measure the power.
        - a. If the result is not equal (may vary between 0.1 to 0.2 dB) to recorded value in Step 1c, replace the fiber.
        - b. If the result is equal to recorded value in Step 1c, reconnect the fiber.
      3. Connect a multi-wave meter to OUT 2 of the OMU1 and measure the OCHAN power is per [“DLP-528: LBO Application” \(14-59\)](#)
        - a. If the result is **not** per [“DLP-528: LBO Application” \(14-59\)](#) , determine the source of the problem, or contact the appropriate maintenance support organization for technical assistance.
        - b. If the result **is** per [“DLP-528: LBO Application” \(14-59\)](#), continue.
      4. Using the CIT, read the power associated with the channel at next (Repeater/WAD) node in the downstream path up to the adjacent node that has the TCA
        - a. If the current value is **outside** the range per *WaveStar® OLS 1.6T Applications and Planning Guide*, (365-575-713R6.2), Technical Specifications, Table 7-11, determine the source of the problem, or contact the appropriate maintenance support organization for technical assistance.
        - b. If the current value **is** per *WaveStar® OLS 1.6T Applications and Planning Guide*, (365-575-713R6.2), Technical Specifications, go to the next node and repeat Step 4.
- 
- 4** If, after all the nodes are checked, the problem persists, contact the appropriate maintenance support organization for technical assistance.

- 
- 5 Notify the person responsible for all affected service or protection signals assigned to this OA that the Optical Line can now be returned to service.
- 

- 6 STOP! YOU HAVE COMPLETE THIS PROCEDURE.

END OF STEPS

---

**For many or all channels:**

**Important!** This indicates that a common circuit pack - OMON - is failed.

---



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 2 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 
- 2 Replace the OMON circuit pack. An auto-baseline of all the channels at that node occurs because of the new init map when the circuit connection is made only.
- 
- 3 Allow the circuit pack to reboot.
- 
- 4 If the problem persists, contact the appropriate maintenance support organization for technical assistance.
-

- 
- 5** Notify the person responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

END OF STEPS

---



## TAP-216: Clear 'TCA Optics: OCHAN (SPT-C)'

---

**Overview** The transmit signal power for a specific optical channel has either exceeded the high threshold or has dropped below the low threshold.

**Before You Begin** Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm. All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Display the Default Threshold** The following is the procedure for displaying the default threshold:

---

**1** From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number.

---

**2** Click on **OCHAN-( )e/w-( )**.

---

**3** Click on **PERFORMANCE-Provision Threshold**.

**Important!** It can take as much as 10 minutes for a TCA to activate or clear.

---

**4** Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value.

END OF STEPS

---

Recommended Action .....



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 2 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.  
.....
- 2 If the power is per *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), Technical Specifications, then
  1. Manually re-baseline the OCHAN. Refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#)
  2. If problem persists, contact the appropriate maintenance support organization for technical assistance
  3. STOP! YOU HAVE COMPLETED THIS PROCEDURE......
- 3 If the power is not per Table 7-11 of *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), Technical Specifications:
  1. Determine the problem, rectify and manually re-baseline, Refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).
  2. If problem persists, contact the appropriate maintenance support organization for technical assistance......
- 4 Notify the person responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

END OF STEPS



## TAP-217: Clear 'TCA Optics: OLINE (PLE-RPx) {x=1-6}'

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>                      | It is an indication of the level of performance of the receive OA six pump lasers. This is a measure of aging. This is an indication that the user provisioned threshold for EOL has been crossed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Display the Default Threshold</b> | <p>The following is the procedure for displaying the default threshold:</p> <hr/> <ol style="list-style-type: none"> <li>1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number</li> <li>2 Click on <b>Line () (Optical Line)</b></li> <li>3 From the Main menu, select <b>PERFORMANCE-Provision Threshold</b>.<br/><b>Important!</b> It can take as much as 10 minutes for a TCA to activate or clear.</li> <li>4 In the Set Threshold Optical Line dialog box, click on <b>Rx Laser Efficiency Tab</b>.</li> <li>5 Select <b>OK</b></li> </ol> <p><b>Important!</b> The default value is 0.80; all values entered must be a 3-character string, i.e., 0.50, 1.50, etc.</p> <li>6 Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds that can cause inadvertent activation of TCAs, and, as a result, may require adjusting the current threshold value.</li> <p>END OF STEPS</p> |

Recommended Action



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 2 could result in service interruption.*

- 1 Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this OA to manually switch the service line or channel to a protection line or ensure all protection lines or channels assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.

- 2 Determine which OA to replace.

- 3 Using the AID and Description columns from the report in Step 1, identify the circuit pack (use the line identifier, for example, Line 1E) associated with this incoming failure condition.

**Important!** The circuit pack identified in the AID column can be located in *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), Bay Configurations.

- 4 Remove the shelf cover. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 5 Replace the OA circuit pack identified in Step 2. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 6 Retrieve a **REPORTS - Conditions** list.

- 7 Did the alarm clear?

| IF... | THEN...               |
|-------|-----------------------|
| YES   | Continue with Step 8. |



| IF... | THEN...               |
|-------|-----------------------|
| NO    | Continue with Step 9. |

- 8 Baseline the replaced circuit pack. For details, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).

- 9 Replace the shelf cover. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 10 Did the alarm clear?

| IF... | THEN...                                                                                                                                                  |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| YES   | Notify the person responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.. |
| NO    | Contact the appropriate maintenance support organization for technical assistance.                                                                       |

END OF STEPS



## TAP-218: Clear 'TCA Optics: OLINEx (PLE-TPx) {x=1-6}'

---

**Overview** This indicates the level of performance of the transmit OA six pump lasers. This measures aging and indicates that the user provisioned threshold for End of Life (EOL) has been crossed.

**Display the Default Threshold** The following is the procedure for displaying the default threshold:

---

**1** From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number

---

**2** Click on **Line () (Optical Line)**

---

**3** From the Main menu, select **PERFORMANCE- Provision Threshold**.

**Important!** It can take as much as 10 minutes for a TCA to activate or clear.

---

**Important!** The default value is 0.80; all values entered must be a 3-character string, i.e., 0.50, 1.50, etc.

---

**4** Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value. Make sure that the threshold is set for an EOL value. The original value for EOL is 0.8.

END OF STEPS

---

Recommended Action



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 2 Using the AID and Description columns from the **REPORTS - Conditions** report, identify the circuit pack (use the line identifier, for example, Line 1E) associated with this incoming failure condition.

**Important!** The circuit pack identified in the AID column can be located in *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), Bay Configurations.

- 3 Remove the shelf cover. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- 4 Replace the OA circuit pack identified in Step 2. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 5 Retrieve a **REPORTS - Conditions**.
- 6 Did the alarm clear?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 7. |
| <b>NO</b>  | Continue with Step 8. |

- 7 Baseline the replaced circuit pack. For help, refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#).

- .....
- 8 Replace the shelf cover. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 9 Did the alarm clear?

| IF...      | THEN...                                                                                                                                                  |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Notify the person responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.. |
| <b>NO</b>  | Contact the appropriate maintenance support organization for technical assistance.                                                                       |

.....

END OF STEPS

.....



## TAP-219: Clear 'TCA Optics: OTU OC-48/STM-16 (OPR)'

---

**Overview** The amount of signal power received by the OTU has dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

### Recommended Action For Add OTU

Follow these steps to clear this TCA:

---



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.

---

- 2 Fix/replace the external connecting equipment that is connected to the OTU, connecting fiber or connector(s).

---

- 3 If problem persists, contact the appropriate maintenance support organization for technical assistance.

- 
- 4 Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.
- 

- 5 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

END OF STEPS

---

**Recommended Action For  
Drop OTU**

Follow these steps to clear this TCA:

---

- 1 Determine the frequency/wavelength of the optical channel received at the OTUD port.

---

- 2 Using the CIT, select **PERFORMANCE-Reports** to obtain a PM Report. Check the receive OA in the same node as the OTUD for an OCHAN TCA. If the TCA is present it should be listed in the NE Alarm List.

---

- 3 If there is an OCHAN TCA, clear this TCA.

---




**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 4 could result in service interruption.*

- 4 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.

- 
- 5** Using the CIT, select **PERFORMANCE-Reports** to obtain a PM Report. Check the receive OA in the same node as the OTUD for an OCHAN TCA. check the OCHAN power at the output of the OA.
1. Using a power meter, measure the power at the associated output port of the ODU.
  2. Subtract the OCHAN power level from the ODU output port power level.
    - If the result is more than the expected loss per *WaveStar® OLS 1.6T Applications and Planning Guide*, (365-575-713R6.2), Technical Specifications, the LBOs and/or fiber(s) that connect the ODUs and/or ODU to the OTUD port may be dirty or defective.
    - If the difference is within the expected value, contact the appropriate maintenance support organization for technical assistance.

- 
- 6** Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

END OF STEPS



## TAP-220: Clear 'TCA Optics: OTU OC-48/STM-16 (OPT)'

---

**Overview** The amount of signal power transmitted by the OTU has exceeded the high threshold or dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Recommended Action** Follow these steps to clear this TCA:

---



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.

---

- 2 Replace the OTU circuit pack as per instruction in [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

---

- 3 If problem persists, contact the appropriate maintenance support organization for technical assistance.



.....  
**4** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

.....  
**5** Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

.....  
E N D O F S T E P S



## TAP-221: Clear 'TCA Optics: OTU OC-48/STM-16 (LBC)'

**Overview** The value of the LASER bias current has exceeded the high threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

### Recommended Action



#### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 2 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 2 Replace the OTU circuit pack as per instructions in ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#).
- 3 Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

END OF STEPS



## TAP-222: Clear 'TCA Optics: OTU OC-192/STM-64 (OPR)'

---

**Overview** The amount of signal power received by the OTU has dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

### Recommended Action For Add OTU

Follow these steps to clear this TCA:

---



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.

---

- 2 Fix/replace the external connecting equipment that is connected to the OTU, connecting fiber or connector(s).

---

- 3 If problem persists, contact the appropriate maintenance support organization for technical assistance.

- 
- 4 Notify the person responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.
- 

- 5 STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS

---

**Recommended Action For  
Drop OTU**

Follow these steps to clear this TCA:

---

- 1 Determine the frequency/wavelength of the optical channel received at the OTUD port. If the TCA is present it should be listed in the NE Alarm List.
- 
- 2 Using the CIT, check the receive OA in the same node as the OTUD for an OCHAN TCA.
- 
- 3 If there is an OCHAN TCA, clear this TCA.
- 



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 4 could result in service interruption.*

- 4 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.

- 
- 5 If there is no associated OCHAN TCA, using the CIT, select **PERFORMANCE-Reports** to obtain a PM Report. Check the OCHAN power at the output of the OA.
1. Using a power meter, measure the power at the associated output port of the ODU.
  2. Subtract the OCHAN power level from the ODU output port power level.
    - If the result is more than the expected loss per *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), Technical Specifications, the LBOs and/or fiber(s) that connect the ODUs and/or ODU to the OTUD port may be dirty or defective.
    - If the difference is within the expected value, contact the appropriate maintenance support organization for technical assistance.
- 
- 6 Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

END OF STEPS



## TAP-223: Clear 'TCA Optics: OTU OC-192/STM-64 (OPT)'

---

**Overview** The amount of signal power transmitted by the OTU has exceeded the high threshold or dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Recommended Action** Follow these steps to clear this TCA:

---



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.

---

- 2 Replace the OTU circuit pack as per instruction in [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

---

- 3 If problem persists, contact the appropriate maintenance support organization for technical assistance.

- 
- 4** Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.
- 

- 5** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS

---



# TAP-224: Clear 'TCA Optics: OTU OC-192/STM-64 (LBC)'

**Overview** The value of the LASER bias current has exceeded the high threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm. All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Display the Default Threshold** The following is the procedure for displaying the default threshold:

- 1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number
- 2 Click on **Line () (Optical Line)**
- 3 From the Main menu, select **PERFORMANCE-Provision Threshold**.  
**Important!** It can take as long as 10 minutes for a TCA to activate or clear.
- 4 Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value.

END OF STEPS



**Recommended Action** Follow these steps to clear this TCA:

.....



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1** Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.  
  
.....
- 2** Replace the OTU circuit pack as per instruction in ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#).  
  
.....
- 3** If problem persists, contact the appropriate maintenance support organization for technical assistance.  
  
.....
- 4** Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.  
  
.....
- 5** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS

.....



# TAP-225: Clear 'TCA Optics: OTU HSBB (OPR)'

**Overview** The amount of signal power received by the OTU has dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm. All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Display the Default Threshold** The following is the procedure for displaying the default threshold:

- 1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number
- 2 Click on **Line () (Optical Line)**
- 3 From the Main menu, select **PERFORMANCE-Provision Threshold**.  
**Important!** It can take as long as 10 minutes for a TCA to activate or clear.
- 4 Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value.

END OF STEPS

**Recommended Action For  
Add OTU**



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in  
Step 1 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 2 Replace the OTU circuit pack as per instruction in ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#).
- 3 If problem persists, contact the appropriate maintenance support organization for technical assistance.
- 4 Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.
- 5 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**  
END OF STEPS

**Recommended Action For  
Drop OTU**

Follow these steps to clear this TCA:

- 1 Determine the frequency/wavelength of the optical channel received at the OTUD port.  
.....
- 2 Using the CIT, check the receive OA in the same node as the OTUD for an OCHAN TCA. If the TCA is present it should be listed in the NE Condition List.  
.....
- 3 If there is an OCHAN TCA, clear this TCA.  
.....



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 4 could result in service interruption.*

- 4 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.

- 
- 5 Using the CIT, select **PERFORMANCE-Reports** to obtain a PM Report. Check the OCHAN power at the output of the OA.
1. Using a power meter, measure the power at the associated output port of the ODU.
  2. Subtract the OCHAN power level from the ODU output port power level.
    - If the result is more than the expected loss per *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2), Technical Specifications, the LBOs and/or fiber(s) that connect the ODUs and/or ODU to the OTUD port may be dirty or defective.
    - If the difference is within the expected value, contact the appropriate maintenance support organization for technical assistance.

Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

END OF STEPS

---



# TAP-226: Clear 'TCA Optics: OTU HSBB (OPT)'

**Overview** The amount of signal power transmitted by the OTU has exceeded the high threshold or dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm. All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Display the Default Threshold** The following is the procedure for displaying the default threshold:

1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number

2 Click on **Line () (Optical Line)**

3 From the Main menu, **PERFORMANCE-Provision Threshold.**

**Important!** It can take as long as 10 minutes for a TCA to activate or clear.

4 Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value.

END OF STEPS

**Recommended Action** Follow these steps to clear this TCA:



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1** Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 2** Replace the OTU circuit pack as per instruction in ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#).
- 3** If problem persists, contact the appropriate maintenance support organization for technical assistance.
- 4** Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.
- 5** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS



# TAP-227: Clear 'TCA Optics: OTU HSBB (LBC)'

**Overview** The value of the LASER bias current has exceeded the high threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm.

All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

## Display the Default Threshold

The following is the procedure for displaying the default threshold:

- 1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number
- 2 Click on **Line () (Optical Line)**
- 3 From the Main menu, select **PERFORMANCE-Provision Threshold**.  
**Important!** It can take as long as 10 minutes for a TCA to activate or clear.
- 4 Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value.

END OF STEPS



**Recommended Action** Follow these steps to clear this TCA:



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1** Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 2** Replace the OTU circuit pack as per instruction in ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#).
- 3** If problem persists, contact the appropriate maintenance support organization for technical assistance.
- 4** Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.
- 5** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS



# TAP-230: Clear 'TCA Optics: SUPVY (SPR-SU)'

**Overview** The power of the receive supervisory signal has either exceeded the high threshold or has dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm. All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

**Display the Default Threshold** The following is the procedure for displaying the default threshold:

- 1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number
- 2 Click on **Line (e/w (Supervisory Channel)**
- 3 From the Main menu, select **PERFORMANCE-Provision Threshold**.  
**Important!** It can take as long as 10 minutes for a TCA to activate or clear.

- 4 Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value.

END OF STEPS

**Recommended Action** Follow these steps to clear this TCA:

- 1 If there is an TOPR-OL on the same line at the same node, use [“TAP 213: Clear TCA Optics 'OLINE \(TOPR-OL\)’” \(13-185\)](#) to clear the TCA before proceeding.
- 2 Using the CIT, select **PERFORMANCE-Reports** RTRV-PM-SUPR to obtain a PM Report:
  1. Read the power of the SUP TX port on the same line at the OA at the upstream adjacent node.
  2. Read the power of the SUP RX port associated with the TCA at the OA.  
Subtract 1 from 2 (span loss)
    - If value is equal to expected span loss, manually re-baseline the SUPVY port. Refer to [“DLP-529: Baseline Optical Parameters” \(14-74\)](#)
    - If problem persists, contact the appropriate maintenance support organization for technical assistance.
    - STOP! YOU HAVE COMPLETED THIS PROCEDURE.



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 3 could result in service interruption.*

- 3 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 4 Determine the problem, for example, a kinked fiber, and correct span loss.
  1. If problem persists, contact the appropriate maintenance support organization for technical assistance.

Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.

2. STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS

---



## TAP-231: Clear 'TCA Optics: SUPVY (SPT-SU)'

---

**Overview** The power of the transmit supervisory signal has either exceeded the high threshold or has dropped below the low threshold.

Ensure the following:

Make sure there are **no** standing alarms that can attribute to the TCA(s), for example, if there is an OCHAN TCA make sure that the corresponding upstream add OTU is not in alarm. All TCAs have a default threshold value that was carefully chosen. With the exception of OPR and OPT, all TCAs can be user-provisioned.

If the TCA is occurring on more than one node associated with the same channel/wavelength, start the following trouble-clearing process at the first upstream node that is reporting the TCA. Fixing this node first may very well clear the TCA at the other downstream nodes.

### Display the Default Threshold

The following is the procedure for displaying the default threshold:

---

- 1 From the CIT's NE Equipment Explorer, select the bay, shelf and slot/CP number  

---
- 2 Click on **Line (e/w (Supervisory Channel))**  

---
- 3 From the Main menu, select **PERFORMANCE-Provision Threshold**.  
  

**Important!** It can take as long as 10 minutes for a TCA to activate or clear.

---
- 4 Before taking the recommended action, please check the sensitivity of the current user-provisioned thresholds which can cause inadvertent activation of TCAs, and, as a result, may only require adjusting the current threshold value.

END OF STEPS

---

**Recommended Action** Using the CIT, select **PERFORMANCE-Reports-Supervisory** to obtain a Performance Monitoring report. Read the power of the SUP TX port associated with the TCA at the OA at node where TCA is active

---



## CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 1 could result in service interruption.*

- 1 Notify the person responsible for the optical line associated with the service or protection signals assigned to this OA to manually switch the service line to a protection line or ensure all protection lines assigned to this OA are not being used for service. Another option is to restore service on a different Optical Line System or route.
- 2 If the power is within the range of -2 to +3 dBm, manually re-baseline the SUPVY port. Refer to DLP-529: Baseline Optical Parameters (10-76).
- 3 If the power is outside the range
  1. Using a power meter, disconnect the fiber to the SUP TX port of the OA, connect the power meter and measure the power
  2. If the power is within the range from Step
    - a. Replace the LBO at the SUP TX port of the OA, reconnect the fiber to the SUP TX port of the OA and measure power using the CIT.
    - b. If the problem persists, contact the appropriate maintenance support organization for technical assistance.  
Notify the person that is responsible for all affected service or protection signals assigned to this OA that this Optical Line can now be returned to service.
    - c. STOP! YOU HAVE COMPLETED THIS PROCEDURE.

3. If power is outside the range
  - a. LBO at output port of the SUPVY or the fiber that connects SUPVY to OA is defective; replace and measure power
  - b. If power is still outside the range, replace the SUPVY circuit pack.

END OF STEPS

---



## TAP-232: Clear 'Incoming ORS Client LOS'

**Overview** The power detector located on the C1 IN/C2 IN port of the ORS circuit pack has detected a substantial decrease in the incoming client signal power.

### Procedure

- 1 Refer to the AID column of the **REPORTS - Conditions** report and determine the bay location of the ORS circuit pack.
- 2 Remove the appropriate shelf cover. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 3 Refer to the AID column of the NE Condition List report and determine the port, C1 IN or C2 IN, reporting the failure.
- 4 Make a visual inspection of the incoming signal cable and connections and correct any problems found. For details, [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#)
- 5 Did a visual inspection reveal any problems?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 6. |
| <b>NO</b>  | Continue with Step 8. |

- 6 At the CIT, select **REPORTS - Conditions** to obtain a report.
- 7 Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 30. |
| <b>NO</b>  | Continue with Step 8.  |



- .....
- 8** Notify the person/client responsible for the service assigned to the failed ORS Port (C1 IN or C2 IN) to switch service on a different route.
- .....
- 9** Make an optical power measurement on the incoming optical jumper connected to the ORS Port (C1 IN or C2 IN) reporting the failure.
- .....
- 10** Using the power level reading obtained in Step 9 and the appropriate row of [Table 14-3, "OTU Input Power Range" \(14-54\)](#) of ["DLP-524: Connect Optical Power Meter for Measurement at OTU \(\) IN \(\) Port" \(14-51\)](#), determine if the power level is within range. For wavelengths of 1550 nm range, the measured power level should be between -16 dBm to 0.5 dBm. For wavelengths of 1300 nm range, the measured power level should be between -15 dBm to 0.5 dBm. Is the measured power level within range?

| IF... | THEN...                |
|-------|------------------------|
| YES   | Continue with Step 15. |
| NO    | Continue with Step 11. |

- .....
- 11** Clean the incoming fiber jumper. For details, refer to ["DLP-510: Inspect and Clean Optical Fiber Connectors" \(14-12\)](#).
- .....
- 12** Connect the incoming fiber jumper to the correct ORS (C1 IN or C2 IN) port.
- .....
- 13** Initiate a Trouble Report to the source of the failed incoming signal indicating the type of failure. If the source of the failed incoming signal returns a trouble report indicating "no trouble found," then contact the appropriate maintenance support organization for further technical assistance. For details, refer to ["DLP-507: Identify Source of Incoming Signal" \(14-10\)](#).
- .....
- 14** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

- .....
- 15** Obtain an LBO of the same value as the one in the ORS (C1 IN or C2 IN) reporting the failure.
- .....
- 16** Remove the LBO from the ORS (C1 IN or C2 IN) port reporting the failure. For details, refer to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....
- 17** Clean the replacement LBO and install in the ORS (C1 IN or C2 IN) port. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 18** Clean the incoming fiber jumper. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 19** Connect the incoming fiber jumper to the correct ORS (C1 IN/C2 IN) port.
- .....
- 20** At the CIT, select **REPORTS - Conditions** to obtain an updated report.
- .....
- 21** Is the Incoming ORS Client LOS still present?
- | IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 22. |
| <b>NO</b>  | Continue with Step 29. |
- .....
- 22** Notify the person/client responsible for service assigned to both of the ORS Ports (C1 IN or C2 IN) to restore service on a different route.
- .....
- 23** Remove the ORS indicating the incoming failure from the shelf. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).



## CAUTION

*The replacement ORS must have the same (or higher) circuit pack series number.*

- 24 Obtain and install the replacement ORS. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 25 At the CIT, select **REPORTS - Conditions** to obtain an updated report.

- 26 Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 29. |
| <b>NO</b>  | Continue with Step 27. |

- 27 As required, check for a broken LBO, a damaged jumper, or bent or broken pins; replace any broken pin using the BERG MT370-01 pin kit for the METRAL pins. Refer to back plane pin repair/replacement procedures in the **WaveStar® OLS 1.6T Installation Manual** (365-575-717R6.2).

- 28 Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 29.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

- 29 Notify the person/client responsible for the service assigned to this ORS circuit pack that service can now be returned to the normal route.

- 
- 30** Reinstall the shelf cover. For details, refer to [“DLP-511:  
Install/Remove Shelf Cover” \(14-20\)](#).

END OF STEPS

---



## TAP-233: Clear 'Incoming ORS Line LOS'

**Overview** The power detector located on the 1A IN/1B IN port or 2A IN/2B IN port of the ORS circuit pack has detected a substantial decrease in the incoming client signal power.

### Procedure

- 1 Refer to the AID column of the NE Condition List report and determine the bay location of the ORS circuit pack.
- 2 Remove the appropriate shelf cover. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 3 Refer to the AID column of the **REPORTS - Conditions** report and determine the port, 1A IN, 1B IN, 2A IN, or 2B IN, reporting the failure.



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 4 could result in service interruption.*

- 4 Make a visual inspection of the incoming signal cable and connections and correct any problems found. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- 5 Did a visual inspection reveal any problems?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 6. |
| <b>NO</b>  | Continue with Step 8. |

- 6 At the CIT, select **REPORTS - Conditions** to obtain a report.

- 7 Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 46. |
| <b>NO</b>  | Continue with Step 8.  |

- 8 At the CIT, select **REPORTS - Conditions** to obtain a report and ensure that an ORS signal fail auto switch is listed for the failed ORS port listed in Step 3. Notify the person/client responsible for the service assigned to the failed ORS Port (1A IN, 1B IN, 2A IN, or 2B IN) identified in Step 3 to switch service on a different route.

- 9 Make an optical power measurement on the incoming optical jumper connected to the ORS Port (1A IN, 1B IN, 2A IN, or 2B IN) reporting the failure. For wavelengths of 1550 nm range, the measured power level should be between -16 dBm to 0.5 dBm. For wavelengths of 1300 nm range, the measured power level should be between -15 dBm to 0.5 dBm. Is the measured power level within range?

- 10 Is the measured power within the required range?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 31. |
| <b>NO</b>  | Continue with Step 11. |

- 11 Clean the incoming fiber jumper. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- 12 Connect the incoming fiber jumper to the correct ORS (1A IN, 1B IN, 2A IN, or 2B IN) port.

- 13 At the CIT select Reports> Port Associations List, then in the Select List Constraint dialog box, select Bay, Shelf, Slot with the failed ORS condition.

- .....
- 14** Using the destination port column of the port from Step 13, locate the ORS port with the failed connection. Then, using the source port AID column to the left of the Destination Port, AID column, determine the source of the incoming signal.
- .....

- 15** Is the identified source of the incoming signal in this system or external equipment?

| IF...                                                                                        | THEN...                |
|----------------------------------------------------------------------------------------------|------------------------|
| In this system,                                                                              | Continue with Step 16. |
| External equipment, use local office records to determine the source of the incoming signal, | Continue with Step 16. |

.....

- 16** Make a visual inspection of the fiber jumper and connections at the OTU () port on the OTU connected to the ORS port reporting the failure and correct any problems found. For details, refer to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#)
- .....

- 17** Did the visual inspection reveal any problems?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 18. |
| NO         | Continue with Step 20. |

.....

- 18** At the CIT, select **REPORTS - Conditions** to obtain a report.
- .....

- 19** Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 46. |
| NO         | Continue with Step 20. |

- .....
- 20** Make an optical power measurement at the OUT port of the OTU identified in Step 15.
- .....

- 21** Is the measure power within the required range?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 22  |
| <b>NO</b>  | Continue with Step 26. |

.....

- 22** Replace fiber jumper between the OTU OUT ( ) port and the ORS port reporting failure.
- .....

- 23** At the CIT, select **REPORTS - Conditions** to obtain a report.
- .....

- 24** Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 46.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

.....

- 25** STOP! YOU HAVE COMPLETED THIS PROCEDURE.
- .....

- 26** Remove the OTU identified as the source of the incoming signal from Step 15.
- .....

- 27** Obtain and install a replacement for the OTU. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 28** At the CIT, select **REPORTS - Conditions** to obtain a report.



.....

**29** Did the condition clear?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Go to Step 46.                                                                             |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

.....

**30** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

.....

**31** Obtain an LBO of the same value as the one in the ORS port reporting the failure.

.....

**32** Remove the LBO from the ORS port reporting the failure. For details, refer to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).

.....

**33** Clean the replacement LBO and install in the ORS port. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

.....

**34** Clean the incoming fiber jumper. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

.....

**35** Connect the incoming fiber jumper to the correct ORS port.

.....

**36** At the CIT, select **REPORTS - Conditions** to obtain a report.

.....

**37** Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 46. |
| <b>NO</b>  | Continue with Step 38. |

- .....
- 38** Notify the person/client responsible for the service assigned to the both of the ORS ports (C1 IN and C2 IN) to restore service on a different route.
- .....
- 39** Remove the ORS indicating the incoming failure from the shelf. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

**CAUTION**

*The replacement ORS must have the same (or higher) circuit pack series number.*

- 40** Obtain and install the replacement ORS. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....
- 41** At the CIT, select **REPORTS - Conditions** to obtain a report.
- .....
- 42** Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 45. |
| <b>NO</b>  | Continue with Step 43. |

- .....
- 43** As required, check for a broken LBO, a damaged jumper, or bent or broken pins; replace any broken pin using the BERG MT370-01 pin kit for the METRAL pins. Refer to back plane pin repair/replacement procedures in the **WaveStar® OLS 1.6T Installation Guide** (365-575-717R6.2).
- .....
- 44** Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 45.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

- .....
- 45** Notify the person/client responsible for the service assigned to this ORS circuit pack that service can now be returned to the normal route.
- .....

- 46** Reinstall the shelf cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

.....

END OF STEPS

.....



## TAP-234: Address 'Incoming LOS Signal Failure When OTU is Associated with ORS'

**Overview** This procedure is used to clear an Incoming ( ) LOS Failure condition associated with an Optical Redundancy Switch.

### Procedure

- 1 Is the OTU reporting the condition an ADD OTU or a DROP OTU?

| IF...                | THEN...                |
|----------------------|------------------------|
| <i>If an ADD OTU</i> | Continue with Step 2.  |
| <i>If a DROP OTU</i> | Continue with Step 15. |

- 2 Make an optical power measurement at the 1A OUT, 1B OUT, 2A OUT, or 2B OUT ports of the ORS associated with the OTU port reporting the failed condition.

- 3 Is the measured power level within the values-required range of the table at the end of the steps in [“DLP-524: Connect Optical Power Meter for Measurement at OTU \( \) IN \( \) Port” \(14-51\)](#)?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 4. |
| <b>NO</b>  | Continue with Step 7. |

- 4 Replace the fiber jumper between the OTU IN ( ) port of the OTU reporting the failed condition and the ORS switch.

- 5 At the CIT, select **REPORTS - Conditions** to obtain a report.

- 6 Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 27. |

| IF...     | THEN...                                                                                    |
|-----------|--------------------------------------------------------------------------------------------|
| <b>NO</b> | Contact the appropriate maintenance support organization for further technical assistance. |

- .....
- 7** Notify the person/client responsible for the service assigned to the both of the ORS ports (C1 IN and C2 IN) to restore service on a different route.
  - .....
  - 8** Remove the ORS associated with this trouble condition. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
  - .....
  - 9** Obtain and install the replacement ORS. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
  - .....
  - 10** At the CIT connected to the Optical Line System with the OTU reporting the failure, select NE Condition List icon to obtain a report.
  - .....
  - 11** Is the Incoming ( ) LOS Failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 12. |
| <b>NO</b>  | Continue with Step 26. |

- .....
- 12** Remove the replacement circuit pack and reinstall the circuit pack that was originally removed. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
  - .....
  - 13** Contact the appropriate maintenance support organization for further technical assistance.
  - .....
  - 14** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

- .....
- 15** Make an optical power measurement at the ODU port associated with the OTU reporting the failed condition.
- .....

- 16** Is the measured power level within the values-required range of the table at the end of the procedure steps in [“DLP-524: Connect Optical Power Meter for Measurement at OTU \( \) IN \( \) Port” \(14-51\)](#)?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 17. |
| <b>NO</b>  | Continue with Step 20. |

.....

- 17** Replace the fiber jumper between the ODU port measured in Step 15 and the OTU ( ) IN port reporting the failed condition.
- .....

- 18** At the CIT, select the **REPORTS - Conditions** to obtain a report.
- .....

- 19** Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 26.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

.....

- 20** Notify the person responsible for the optical line associate with the service or protection signals assigned to the ODU circuit pack; 1) to manually switch the service line to a protection line, and 2) to ensure that all protection lines that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System.
- .....

- 21** Remove the ODU associated with this failed condition. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

.....

**22** Obtain a replacement circuit pack with the same or a higher series number and install the circuit pack.

.....

**23** Wait 15 minutes for the ODU to warm up and boot.

.....

**24** At the CIT, select the **REPORTS - Conditions** to obtain a report.

.....

**25** Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 26.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

.....

**26** Notify the person responsible for all service/protection signals assigned to the ODU circuit pack that the signals can be returned to service.

.....

**27** Reinstall the shelf cover. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

.....

E N D O F S T E P S

.....



## TAP-235: Address 'DCM Port Loss Out of Range'

**Overview** The power detectors located on the DCM IN and DCM OUT ports of the OA circuit pack have detected a substantial increase in optical loss between the DCM IN and DCM OUT ports.

### Procedure

- 1 Refer to the AID column of the **REPORTS - Conditions** report and determine the bay location of the OA circuit pack.
- 2 Remove the appropriate shelf cover. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- 3 Refer to the AID column of the **REPORTS - Conditions** report and determine the DCM port, and the OA circuit pack reporting the failure, using fiber labels and/or fiber routing tables in the **WaveStar® OLS 1.6T Installation Manual** (365-575-717R6.2) to locate the DCM apparatus unit associated with the DCM ports reporting the failure.
- 4 Make a visual inspection of the fiber jumpers and connections at the OA circuit pack DCM ports and DCM apparatus unit IN and OUT ports. Correct any problems found. For help, refer to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).
- 5 Did the visual inspection reveal any problems?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 6. |
| <b>NO</b>  | Continue with Step 8. |

- 6 At the CIT, select **REPORTS - Conditions** to obtain a report.
- 7 Is the failure condition cleared?



| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 43. |
| <b>NO</b>  | Continue with Step 8.  |

- .....
- 8** Notify the person responsible for service assigned to the failed OA-DCM port identified in Step 3 to switch service on a different route.  
.....
  - 9** Remove the LBO at the DCM OUT port on the OA circuit pack and replace it with a 0-dB LBO. For help, refer to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).  
.....
  - 10** Make an optical power measurement at the DCM OUT port of the OA circuit pack reporting the failure. Record the measured level.  
.....
  - 11** Remove the 0-dB LBO at the DCM OUT port on the OA circuit pack and replace it with the original LBO removed in Step 9. For help, refer to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).  
.....
  - 12** With the original LBO in place, make another optical power measurement at the DCM OUT port of the OA circuit pack. Record the measured level.  
.....
  - 13** Compare the measured power level recorded in Step 10 with the measured power level recorded in Step 12.  
.....
  - 14** Is the measured power level recorded in Step 12 lower in power by the same amount as the LBO value?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 22. |
| <b>NO</b>  | Continue with Step 15. |

.....

**15** Obtain a replacement LBO of the same value as the LBO removed from the DCM OUT port in Step 9.

.....

**16** Clean the replacement LBO and install in the DCM OUT port of the OA circuit pack. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

.....

**17** With the replacement LBO in place, make another optical power measurement at the DCM OUT port of the OA circuit pack. Record the measured level.

.....

**18** Compare the measured power level recorded in Step 10 with the measured power level recorded in Step 17.

.....

**19** Is the measured power level recorded in Step 17 lower in power by the same amount as the LBO value?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 20.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

.....

**20** Clean the fiber connectors and reconnect the fiber jumper to the DCM OUT port of the OA circuit pack reporting the failure. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

.....

**21** Is the failure condition cleared?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 42. |
| <b>NO</b>  | Continue with Step 23. |

- .....
- 22** Clean the fiber connectors and reconnect the fiber jumper to the DCM OUT port of the OA circuit pack reporting the failure. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 23** Disconnect the fiber jumper that is connected to the IN port of the DCM apparatus unit.
- .....

- 24** Connect the fiber jumper disconnected in Step 23 to a power meter and obtain a power measurement.
- .....

- 25** Is the power measurement obtained from Step 24 within +/- 0.5 dB of the power measurement made in Step 12?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 28. |
| <b>NO</b>  | Continue with Step 26. |

.....

- 26** Clean connectors and replace the fiber jumper between the OA circuit pack DCM OUT and DCM apparatus unit IN ports.
- .....

- 27** Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 42.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

.....

- 28** Clean the fiber connectors and reconnect the fiber jumper to the IN port of the DCM apparatus unit. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 29** Disconnect the fiber jumper that is connected to the OUT port of the DCM apparatus unit.
- .....

- .....
- 30** Make an optical power measurement at the DCM apparatus unit of the OUT port.
- .....

- 31** Is the power measurement obtained from Step 30 within 10 dB of the power measurement obtained from Step 12?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 34. |
| <b>NO</b>  | Continue with Step 32. |

.....

- 32** Replace the DCM apparatus unit. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- .....

- 33** Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 42.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

.....

- 34** Clean the fiber connectors and reconnect the fiber jumper to the OUT port of the DCM apparatus unit. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 35** Disconnect the fiber jumper at the OA circuit pack DCM IN port.
- .....

- 36** Connect the fiber jumper disconnected in Step 35 to the power meter and make a power measurement.
- .....

- 37** Is the power measurement obtained from Step 36 within 11 dB of the power measurement obtained from Step 12?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 40. |
| <b>NO</b>  | Continue with Step 38. |

- .....
- 38** Clean connectors and replace the fiber jumper between the OA circuit pack DCM IN port and DCM apparatus unit OUT port. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 39** Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 42.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

- .....
- 40** Clean OA-DCM IN port and fiber jumper connector and reconnect fiber jumper to the OA-DCM IN port on the OA. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 41** Is the failure condition cleared?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with Step 42.                                                                     |
| <b>NO</b>  | Contact the appropriate maintenance support organization for further technical assistance. |

- .....
- 42** Notify the person responsible for the service assigned to the OA-DCM port identified in Step 3 that service can now be returned to the normal route.
- .....

- 43** Reinstall the shelf cover. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

END OF STEPS



## TAP-236: Clear 'OCh Payload Label Mismatch'

**Overview** This alarm condition is issued when the system software detects at the receive OTU (OTUD70) a signal source other than a 2.5 Gb/s signal intended for a 4:1 10G Multiplex OTU (OTU70/OTUD70).

### Procedure

- 1 At the CIT, select **REPORTS - Conditions** to obtain a report.
- 2 Using the AID column from the report (Step 1), identify the appropriate shelf, slot location and the OCh (Optical Channel associated with a 4:1 10G Multiplex OTU) port of the OTU with the alarm condition.
- 3 Remove the shelf cover. All connections can be accessed from the front. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 4 could result in service interruption.*

- 4 Make a visual inspection of the incoming signal cable(s) and connections and correct any problems found. For help, refer to [“DLP-517: Inspect Optical Fiber\(s\)” \(14-42\)](#).

- 5 Did the visual inspection reveal any problems?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 6. |
| <b>NO</b>  | Continue with Step 8. |

- 6 At the CIT, select **REPORTS - Conditions** to obtain a report.

- 7 Is the OCh Payload Label Mismatch alarm condition cleared?

| IF...      | THEN...               |
|------------|-----------------------|
| <b>YES</b> | Continue with Step 9. |
| <b>NO</b>  | Continue with Step 8. |

- 8 Initiate a Trouble Report to the source of the signal for this 4:1 10G Multiplex OTU. If the source of the alarm condition incoming signal returns a Trouble Report indicating "no trouble found," then contact the appropriate maintenance support organization for further technical assistance.

- 9 Reinstall the shelf cover. For help, refer to ["DLP-511: Install/Remove Shelf Cover" \(14-20\)](#).

- 10 STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS



# TAP-237: Clear 'TCA Digital Alarm OTU OC48 or 192 CVS, ESS, SESS, or SEFESS (15 min/1 day)'

**Overview** This alarm condition is issued when the performance of the Optical Channel has exceeded the performance thresholds established by the customer or factory settings.

**Important!** Degradation of the upstream transmission and equipment quality could cause multiple alarms. Before attempting to clear this alarm, log into the most upstream Network Element with the same alarm condition.

## Procedure

- 1 At the most upstream office with the TCA alarm, use the CIT to access the **REPORTS - Conditions** to obtain a report.
- 2 Using the CIT, select **PERFORMANCE-Reports-OTU Port Signal**.
- 3 In the equipment tree, click on the bay, shelf, and slot for the OTU identified in the Performance Report from Step 2.
- 4 Click on the appropriate Input Port of the OTU identified in Steps 2 and 3.
- 5 In the **OTU Performance Parameter Selection** dialog box,
  1. Choose **Select All** under the OTU PM Parameter Dialog box;
  2. Select **Appropriate Time Bin** under the Time Period Dialog box;
  3. Select **O-UP**(all bins, even those without errors), or **1-UP**(only the bins with errors);
  4. Select OK.
- 6 Using the PM Report, confirm that the identified IN port of the OTU is exceeding the threshold.



- .....
- 7 Remove the appropriate shelf cover. All connections can be accessed from the front. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 8 could result in service interruption.*

- 8 Notify the person responsible for the optical line or optical channel associated with the service or protection signals assigned to this circuit pack to 1) manually switch the service line or optical channel to a protection line; and 2) ensure that all protection lines or optical channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.
- .....
- 9 Make an optical power measurement on the incoming optical jumper that provides input to the IN port at the OTU. For help, refer to DLP-524: Connect Optical Power Meter for Measurement at OTU () IN () Port.
- .....
- 10 Was the measured optical power within the limits?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 27. |
| <b>NO</b>  | Continue with Step 11. |

.....

- 11 Clean the incoming fiber jumper. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 12 Reconnect the incoming fiber jumper to the correct OTU IN port.

.....

**13** Using the CIT, select **PERFORMANCE-Initialize Registers-Port PM Register Initialization**.

.....

**14** Within the equipment tree, click on the bay, shelf, and slot for the desired OTU that was identified in the Performance Report for the exceeded threshold and **Select**.

.....

**15** Within the **Port PM Register Initialization** dialogue box, select the following:

- For **Time Period**, select “appropriate time period”.
- For **Apply TO**, select “OTU pack”.

.....

**16** Select **OK**.

**Important!** Wait 15 minutes before pulling a new alarm list as prescribed in Step 17.

.....

**17** At the CIT, select **REPORTS - Conditions** to obtain a report.

.....

**18** Is the TCA alarm condition cleared?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |
| <b>NO</b>  | Continue with Step 19.                                 |

.....

**19** Is this a drop OTU?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 20. |
| <b>NO</b>  | Continue with Step 26. |

.....

**20** Make an optical power measurement on the incoming optical jumper that provides input to the IN port at the OTUD. For help, refer to

.....

[“DLP-524: Connect Optical Power Meter for Measurement at OTU \(\)  
IN \(\) Port” \(14-51\).](#)

- 21 Was the optical power measurement within the limits?

| IF...                                           | THEN...                                         |
|-------------------------------------------------|-------------------------------------------------|
| <b>YES</b> (OC-192/48 input level equals -17.0) | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| <b>NO</b>                                       | Continue with Step 26.                          |

- 22 Clean the incoming fiber jumper. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\).](#)

- 23 Verify that the input LBO attenuation is as rated. For help, refer to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\).](#)

- 24 Reconnect the incoming fiber jumper to the correct OTUD IN port.

- 25 Is the TCA alarm condition cleared?

| IF...      | THEN...                                         |
|------------|-------------------------------------------------|
| <b>YES</b> | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| <b>NO</b>  | Continue with Step 26.                          |

- 26 Initiate a Trouble Report to the source of the incoming signal indicating the type of failed condition. If the source of the failed incoming condition returns a Trouble Report indicating “No Trouble Found,” then contact the appropriate maintenance support organization for further technical assistance.

END OF STEPS



# TAP-238: Clear 'TCA Digital Alarm OTU OC192 FEC-EC, FEC-UBC (15 min/1 day)'

---

**Overview** This alarm condition is issued when the performance of the Optical Channel has exceeded the performance thresholds established by the customer or factory settings.

**Important!** Degradation of the upstream transmission and equipment quality could cause multiple alarms. Before attempting to clear this alarm, log into the most upstream Network Element with the same alarm condition.

## Procedure

---

**Important!** OTU 192 FEC-EC, FEC-UBC (15 min/1 day) alarms apply only to OTUD and OTU31 (THROUGH) circuit packs.

- 1 At the most upstream office with the TCA alarm, use the CIT to access the **REPORTS - Conditions** to obtain a report that will identify the OTUD.  

---
- 2 Using the CIT, select **PERFORMANCE-Reports-OTUD Port Signal**.  

---
- 3 In the equipment tree, click on the bay, shelf, and slot for the OTUD identified in the Performance Report from Step 2.  

---
- 4 Click on the appropriate Input Port of the OTUD identified in Steps 2 and 3.  

---
- 5 In the **OTUD Performance Parameter Selection** dialog box,
  1. Choose **Select All** under the OTUD PM Parameter Dialog box;
  2. Select **Appropriate Time Bin** under the Time Period Dialog box;
  3. Select **O-UP**(all bins, even those without errors), or **1-UP**(only the bins with errors);
  4. Select **OK**.

- .....
- 6 Using the PM Report, confirm that the identified IN port of the OTUD is exceeding the threshold.
- .....
- 7 Remove the appropriate shelf cover. All connections can be accessed from the front. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#)
- .....



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 8 could result in service interruption.*

- 8 Notify the person responsible for the optical line or optical channel associated with the service or protection signals assigned to this circuit pack to: 1) manually switch the service line or optical channel to a protection line; and 2) ensure that all protection lines or optical channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.
- .....
- 9 Make an optical power measurement on the incoming optical jumper that provides input to the IN port at the OTUD. For help, refer to [“DLP-524: Connect Optical Power Meter for Measurement at OTU \(\) IN \(\) Port” \(14-51\)](#).
- .....
- 10 Was the measured optical power within the limits?

| IF...                                        | THEN...                |
|----------------------------------------------|------------------------|
| <b>YES</b> (OC 192 input level equals -17.0) | Continue with Step 15. |
| <b>NO</b>                                    | Continue with Step 11. |

- .....
- 11 Clean the incoming fiber jumper. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- .....
- 12** Verify that the input LBO attenuation is as rated. For help, refer to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....

- 13** Reconnect the incoming fiber jumper to the correct OTUD IN port.
- .....

- 14** Is the TCA alarm condition cleared?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |
| <b>NO</b>  | Continue with Step 15                                  |

- .....
- 15** Initiate a Trouble Report to the source of the incoming signal indicating the type of failed condition. If the source of the failed incoming condition returns a Trouble Report indicating “No Trouble Found,” then contact the appropriate maintenance support organization for further technical assistance.

END OF STEPS

.....



## TAP-240: Clear 'Outdated Boot Flash'

---

**Overview** This alarm condition is issued when a circuit pack is first powered up. The circuit pack tries to execute updated bootflash software into the circuit pack memory but has failed. Failure of the software to perform an upgrade boot function requires that the circuit pack be returned to the factory for an upgrade to the circuit pack.

### Procedure

---

- 1 At the CIT, select **REPORTS - Conditions** to obtain a report.  
.....
- 2 Using the AID column from the report generated in Step 1, identify the appropriate shelf and circuit pack slot associated with the "Outdated Boot Flash" alarm condition.  
.....
- 3 Remove the appropriate shelf cover. All connections can be accessed from the front. For details, refer to ["DLP-514: Remove and/or Install Circuit Pack" \(14-28\)](#)  
.....
- 4 Is the circuit pack to be replaced an OA/OTU/OMU/ODU/ORS/WAD circuit pack?

| IF...      | THEN...                                                     |
|------------|-------------------------------------------------------------|
| <b>YES</b> | Continue with Step 5.                                       |
| <b>NO</b>  | Continue with Step 7 (if EI, OMON, or SUPVY circuit packs). |

---



### CAUTION

*SERVICE AFFECTING - Failure to follow instructions in Step 5 could result in service interruption.*

- 5 Notify the person responsible for the optical line or optical channel associated with the service or protection signals assigned to this circuit pack to 1) manually switch the service line or optical channel

to a protection line; and 2) ensure that all protection lines or optical channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.

**Important!** A series number S1:2 is the same series number as S1:4. The “2” and “4” refer to minor changes within Series 1.

- 
- 6 Obtain the correct replacement circuit pack with the same or a higher series number and install it in place of the circuit pack with the lighted FAULT LED. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#)

**Important!** If replacing a SUPVY circuit pack and a reboot is in progress, do not pull the circuit pack until the reboot has successfully completed.

- 
- 7 Wait for the time indicated in Table 13-3, “Waiting Times.” (These are best-guess times; the alarm may actually clear sooner.)

**Important!** Replacing the EI circuit pack in either an End Terminal or Repeater will cause the system controller to reboot. Reseating the EI circuit pack in the Repeater will also cause the System Controller to reboot. After replacing an EI circuit pack, the SYstem IDentifier (SYSID) in the Network Service Access Point (NSAP) address will change. The local craft technician should retrieve the new SYSID from the Network Element (e.g., the Repeater) by selecting **CONFIGURATION-Installation Provisioning** to obtain the Installation Provisioning Wizard. Then select 'Next' until the NSAP Address Information window appears and inform the SNMS technician of the new SYSID indicated in that window. After replacing or reseating the EI circuit pack, verify that the system clock is correct. If necessary, reset the system clock.

- 
- 8 Is the FAULT LED lit on the replacement circuit pack?



| IF...      | THEN...                                                                                  |
|------------|------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">“TAP-108: Address Missing or Incorrect Response” (13-23)</a> . |
| <b>NO</b>  | Continue with Step 9.                                                                    |

- .....
- 9** Is the circuit pack just replaced an OA/OTU/OMU/ODU/ORS or WAD circuit pack?

| IF...      | THEN...                                                       |
|------------|---------------------------------------------------------------|
| <b>YES</b> | Continue with Step 10.                                        |
| <b>NO</b>  | Continue with Step 11 (for EI, OMON, or SUPVY circuit packs). |

- .....
- 10** Notify the person who is responsible for all affected service protection signals assigned to this OA/OTU/OMU/ODU/ORS/WAD that this Optical Line or Optical Channel can now be returned to service.

- .....
- 11** Reinstall the shelf cover. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).

- .....
- 12** Did you replace an OA, OMON, or SUPVY circuit pack?

| IF...      | THEN...                                                                                                                |
|------------|------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Baseline the replaced circuit pack. For help, refer to <a href="#">“DLP-529: Baseline Optical Parameters ” (14-74)</a> |
| <b>NO</b>  | Continue with Step 13.                                                                                                 |

- .....
- 13** Is the CR/PROMPT, MJ/DEFERRED, or MN LED lit on the EI circuit pack/User Panel?

| IF...      | THEN...                                                                                                                                                               |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Refer to <a href="#">“TAP-102: Clear CR/PROMPT, MJ/DEFERRED, MN LED, or TCA” (13-8)</a> .                                                                             |
| <b>NO</b>  | Return the circuit pack removed in Step 6 to the factory for an upgrade. Include with the circuit pack an explanation of what problem occurred with the circuit pack. |

**14 STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

END OF STEPS

**Table 13-8 Waiting Times**

| CP Inserted | Waiting Time (minutes) |
|-------------|------------------------|
| EI          | 15-60                  |
| OA          | 5                      |
| ODU         | 15                     |
| OMON        | 3                      |
| OMU         | 15                     |
| ORS         | 3                      |
| OTU         | 10                     |
| SUPVY       | 10                     |
| WAD         | 1                      |



## TAP-241: Clear 'DSA Registration Error'

**Overview** This alarm condition is issued when the Network Element has detected invalid or missing data in the various DSA fields.

### Procedure

- 1 At the CIT, select **CONFIGURATION-Data Communications** menu.
- 2 In the **CONFIGURATION-Data Communications** dialog box, the Network Layer tab appears.
- 3 Verify with the local office records or the system administrator at the Operations Support Center if the information under the DSA name prefix tab is correct.
- 4 Select **OK**. The changed information appears in the appropriate field of the dialog box.
- 5 At the CIT, select **REPORTS - Conditions** to obtain a report.
- 6 Is the DSA Registration Error alarm condition still listed?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | Continue with Step 7.                                  |
| <b>NO</b>  | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

- 7 Initiate a Trouble Report to the responsible Operations Support Center or System Administrator stating an DSA Registration Error alarm condition is still being reported by this network element.

END OF STEPS



# TAP-242: Clear 'MUX OTU LMI'

**Overview** This alarm condition is issued when the sink OTU has detected Loss of Multiframe Indicator (LMI).

## Procedure

- 1 At the CIT, select the **REPORTS - Conditions** menu.
- 2 Using the AID column from the report (Step 1), identify the appropriate shelf associated with the alarm condition.
- 3 Remove the appropriate shelf cover. All connections can be access from the front. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).



### CAUTION

*SERVICE AFFECTING. Step 4 could result in service interruption.*

- 4 Notify the person responsible for the optical line associated with the service or protection signals assigned to this optical multiplex section to: 1) manually switch the service line(s) or channel(s) to a protection line(s); and 2) ensure all protection lines assigned to this OTU are not being used for service.
- 5 Obtain a replacement OTU circuit pack with the same or higher series number and install it in the place of the OTU circuit pack associated with the alarm condition. For help, see [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 6 At the CIT, select **REPORTS - Conditions** to obtain another report, as in Step 1.

- 7 Is the same failure condition still listed?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 8.  |
| <b>NO</b>  | Continue with Step 11. |

- 8 Remove the replacement circuit pack (installed in Step 5) and reinstall the original circuit pack. For help, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#)

- 9 Initiate a Trouble Report to the responsible Operations Support Center or System Administrator indicating the type of trouble that is still being reported by this network element and request that the transmit OTU be replaced.

- 10 Did the source of the failed signal return a trouble Report indicating “No Trouble Found”?

| IF...      | THEN...                                                                                    |
|------------|--------------------------------------------------------------------------------------------|
| <b>YES</b> | Contact the appropriate maintenance support organization for further technical assistance. |
| <b>NO</b>  | Continue with Step 11.                                                                     |

- 11 Notify the person responsible for the optical line or channel associated with the service or protection signals assigned to this optical multiplex section that the section can be returned to service.

- 12 Reinstall the shelf cover. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 13 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

END OF STEPS



# TAP-243: Clear 'TCA Digital Alarm OTU STM-16 or -64 BBE, ESS, SESS, or UASS (15 min/1 day)'

**Overview** This alarm condition is issued when the performance of the Optical Channel has exceeded the performance thresholds established by the customer or factory settings.

**Important!** Degradation of the upstream transmission and equipment quality could cause multiple alarms. Before attempting to clear this alarm, log into the most upstream Network Element with the same alarm condition.

## Procedure

- 1 At the most upstream office with the TCA alarm, use the CIT to access the **REPORTS - Conditions** to obtain a report.
- 2 Within the CIT's NE Equipment Explorer, click on the bay, shelf, and slot for the OTU identified in the Performance Report from Step 2.
- 3 Select the appropriate Input Port of the OTU identified in Steps 2 and 3.
- 4 From the CIT's Main menu, select **PERFORMANCE-Reports**.
- 5 In the **OTU Performance Parameter Selection** dialog box,
  1. Choose **Select All** under the OTU PM Parameter Dialog box;
  2. Select **Appropriate Time Bin** under the Time Period Dialog box;
  3. Select **0-UP** (all bins, even those without errors), or **1-UP**(only the bins with errors);
  4. Select OK.
- 6 Using the resulting pop-up PM Report, confirm that the identified IN port of the OTU is exceeding the threshold.

- .....
- 7 Remove the appropriate shelf cover. All connections can be accessed from the front. For help, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#)
- .....



**CAUTION**

*SERVICE AFFECTING - Failure to follow instructions in Step 8 could result in service interruption.*

- 8 Notify the person responsible for the optical line or optical channel associated with the service or protection signals assigned to this circuit pack to: 1) manually switch the service line or optical channel to a protection line; and 2) ensure that all protection lines or optical channels that are assigned to this circuit pack are not being used for service. Another option is to restore service on a different Optical Line System or route.
- .....
- 9 Make an optical power measurement on the incoming optical jumper that provides input to the IN port at the OTU. For help, refer to [“DLP-524: Connect Optical Power Meter for Measurement at OTU \( \) IN \( \) Port” \(14-51\)](#).
- .....
- 10 Was the measured optical power within the limits?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 26. |
| <b>NO</b>  | Continue with Step 11. |

.....

- 11 Clean the incoming fiber jumper. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 12 Reconnect the incoming fiber jumper to the correct OTU IN port.

- .....
- 13** Within the NE Equipment Explorer, click on the bay, shelf, and slot for the desired OTU that was identified in the Performance Report for the exceeded threshold and **Select**.
- .....

- 14** From the CIT's Main menu, select **PERFORMANCE-Initialize Registers-Port PM Register Initialization**.
- .....

- 15** Within the **Port PM Register Initialization** dialogue box, select the following:
- For **Time Period**, select "appropriate time period".
  - For **Apply TO**, select "OTU pack".
- .....

- 16** Select **OK**.

**Important!** Wait 15 minutes before pulling a new alarm list as prescribed in Step 17.

.....

- 17** At the CIT, select **REPORTS - Conditions** to obtain a report.
- .....

- 18** Is the TCA alarm condition cleared?

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |
| <b>NO</b>  | Continue with Step 19.                                 |

.....

- 19** Is this a drop OTU?

| IF...      | THEN...                |
|------------|------------------------|
| <b>YES</b> | Continue with Step 20. |
| <b>NO</b>  | Continue with Step 26. |

.....

- 20** Make an optical power measurement on the incoming optical jumper that provides input to the IN port at the OTUD. For help, refer to
- .....



[“DLP-524: Connect Optical Power Meter for Measurement at OTU \(\)  
IN \(\) Port” \(14-51\).](#)

- 21 Was the optical power measurement within the limits?

| IF...                                            | THEN...                                         |
|--------------------------------------------------|-------------------------------------------------|
| <b>YES</b> (STM-16 /64 input level equals -17.0) | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| <b>NO</b>                                        | Continue with Step 26.                          |

- 22 Clean the incoming fiber jumper. For help, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\).](#)

- 23 Verify that the input LBO attenuation is as rated. For help, refer to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\).](#)

- 24 Reconnect the incoming fiber jumper to the correct OTUD IN port.

- 25 Is the TCA alarm condition cleared?

| IF...      | THEN...                                         |
|------------|-------------------------------------------------|
| <b>YES</b> | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |
| <b>NO</b>  | Continue with Step 26.                          |

- 26 Initiate a Trouble Report to the source of the incoming signal indicating the type of failed condition. If the source of the failed incoming condition returns a Trouble Report indicating “No Trouble Found,” then contact the appropriate maintenance support organization for further technical assistance.

END OF STEPS







# 14 Detail Level Procedures

## Overview

---

**Purpose** This chapter, *Detail Level Procedures (DLP)* contains detailed “how to” instructions, beginning with [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#).

**Important!** Before attempting any detail level procedures, refer to [Table 14-1, “Detail Level Procedure Index” \(14-3\)](#) for a list of all detail level procedures and the **correct order** in which to perform these tasks.

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|                                                                                                                                    |                              |
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# IXL-001: Detail Level Procedures Index

---

**Detail Level Procedures Index** Refer to [Table 14-1, “Detail Level Procedure Index” \(14-3\)](#) for a list of all Detail Level Procedures.

**Table 14-1 Detail Level Procedure Index**

| Task Description                                                                       | Procedure                                                                                                                |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Connect and Condition Craft Interface                                                  | <a href="#">“DLP-501: Connect and Condition Craft Interface Terminal (CIT)” (14-5)</a>                                   |
| Test LEDs on Front Panel and Circuit                                                   | <a href="#">“DLP-502: Test LEDs on Circuit Packs” (14-7)</a>                                                             |
| Verify WaveStar® OLS 1.6T System Elements are Connected                                | <a href="#">“DLP-506: Verify WaveStar® OLS 1.6T Elements Are Connected ” (14-9)</a>                                      |
| Identify Source of Incoming Signal                                                     | <a href="#">“DLP-507: Identify Source of Incoming Signal ” (14-10)</a>                                                   |
| Install/Remove Apparatus Blank                                                         | <a href="#">“DLP-509: Install/Remove Apparatus Blank” (14-11)</a>                                                        |
| Inspect and Clean Optical Fibers and Connectors                                        | <a href="#">“DLP-510: Inspect and Clean Optical Fiber Connectors” (14-12)</a>                                            |
| Install/Remove Shelf Cover                                                             | <a href="#">“DLP-511: Install/Remove Shelf Cover ” (14-20)</a>                                                           |
| Install/Remove Lightguide Buildout                                                     | <a href="#">“DLP-512: Install/Remove Lightguide Buildout” (14-24)</a>                                                    |
| Install/Remove Circuit Pack                                                            | <a href="#">“DLP-514: Remove and/or Install Circuit Pack” (14-28)</a>                                                    |
| Inspect Optical Fiber(s)                                                               | <a href="#">“DLP-517: Inspect Optical Fiber(s) ” (14-42)</a>                                                             |
| Initiate or Terminate Login Session to a \Network Element Using WaveStar® OLS 1.6T CIT | <a href="#">“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” (14-43)</a> |
| Modify, Disable, Enable or Add a User’s Login or Password                              | <a href="#">“DLP-519: Modify, Disable, Enable or Add a User’s Login and/or Password” (14-45)</a>                         |
| Replace Power Line Filter                                                              | <a href="#">“DLP-522: Replace Power Line Filter” (14-49)</a>                                                             |
| Connect Optical Power Meter for Measurement at OTU                                     | <a href="#">“DLP-524: Connect Optical Power Meter for Measurement at OTU () IN () Port” (14-51)</a>                      |

**Table 14-1 Detail Level Procedure Index (continued)**

| <b>Task Description</b>         | <b>Procedure</b>                                                |
|---------------------------------|-----------------------------------------------------------------|
| Inspect/Replace Dust Filter     | <a href="#">“DLP-526: Inspect/Replace Dust Filter” (14-56)</a>  |
| Replace Fan Assembly            | <a href="#">“DLP-527: Replace Fan Assembly” (14-58)</a>         |
| LBO Applications                | <a href="#">“DLP-528: LBO Application” (14-59)</a>              |
| Baseline Optical Parameters     | <a href="#">“DLP-529: Baseline Optical Parameters ” (14-74)</a> |
| DCM LBO Procedure               | <a href="#">“DLP-530: DCM LBO Procedure” (14-86)</a>            |
| Packaging for Returns Procedure |                                                                 |



## DLP-501: Connect and Condition Craft Interface Terminal (CIT)

---

**Overview** This procedure provides instructions to verify proper connections between a network element and a personal computer (PC). The PC will be running WaveStar® OLS 1.6T CIT software.

**Procedure** **Important!** The PC must meet the minimum personal computer requirements stated in the "Craft Interface Terminal" part of *WaveStar® OLS 1.6T Applications Planning Guide*, (365-575-713R6.2).

---

**Important!** The warning message **NE not responding** can be caused by user being logged out due to inactivity. Initiate a new login session. For details, use this procedure if logging in locally, go to ["DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT" \(14-43\)](#).

- 1 Verify the PC is safely positioned on a cart or table.
- 2 Verify the cable connections at the PC. Reference: *WaveStar® OLS 1.6T Installation Guide* (, 365-575-717R6.2).
- 3 To summarize, check the following:
  - The appropriate interface cable is connected between the **CIT** connector on the EI circuit pack and a serial connector on the PC.
  - If required, a printer with the appropriate printer cable is connected to the PC per the instructions provided with the printer.
- 4 Turn the PC power switch to "on," if necessary.

---

**Important!** See the CIT tutorial available on the WaveStar® OLS 1.6T CD-ROM for examples of screens showing a successful login session.

- 5 Double-click on the WaveStar® OLS 1.6T CIT icon.

- 6 Click on the folder labeled **Most Recent** or **Saved View**.

- 7 Is the desired TID displayed?

| IF...      | THEN...                                                                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Select the TID with the mouse pointer and double click.                                                                                                       |
| <b>NO</b>  | Go to the <i>WaveStar® Optical Line System (OLS) 1.6T Software Release Description</i> , (C109154401), section "TID Address Mapping," to establish a new TID. |

- 8 Type your assigned User ID and press the **Tab** key to advance to the next field.

- 9 Type your assigned password and click on **OK**.

END OF STEPS





## DLP-502: Test LEDs on Circuit Packs

**Overview** Use the procedure below to test the LEDs on the circuit pack faceplates.

### Procedure

- 1 Remove the appropriate shelf cover(s). All LEDs are visible from the front. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 2 At the CIT, select **FAULT-Test-LED** then select the appropriate bay and shelf, then click on the select button.

**Important! Requirement:** All LEDs are lighted for 10 seconds, off for 10 seconds for each iteration, then they return to their normal condition.

- 3 Select the number of iterations and then click on the Start button.

- 4 Did the LED(s) of interest operate as indicated above?

| IF...      | THEN...                              |
|------------|--------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 5</a> |
| <b>NO</b>  | Continue with <a href="#">Step 7</a> |

- 5 Reinstall the shelf cover(s). For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 6 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

- 7 At the CIT, select **FAULT-Test-LED** then select the appropriate bay, shelf, and select 3 iterations for the test.

- 8 Did the same circuit pack LED consistently fail the LED test?

| IF...      | THEN...                               |
|------------|---------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 9</a>  |
| <b>NO</b>  | Continue with <a href="#">Step 10</a> |

- .....
- 9** Contact the appropriate maintenance organization to correct the LED trouble before returning to this procedure.
- .....

- 10** Reinstall the shelf cover(s). For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

.....

END OF STEPS

.....



## DLP-506: Verify WaveStar® OLS 1.6T Elements Are Connected

**Overview** This procedure is used to verify that all network elements are connected.

### Procedure

- 1 At the CIT, select **REPORTS - Conditions** icon to obtain a report.
- 2 Are there any trouble conditions listed in the **DESCRIPTION** column of the report?

| IF...      | THEN...                                                                               |
|------------|---------------------------------------------------------------------------------------|
| <b>NO</b>  | Continue with <a href="#">Step 3</a> .                                                |
| <b>YES</b> | Notify the installation personnel to correct the trouble condition before proceeding. |

- 3 Repeat [Step 1](#) and [Step 2](#) for each network element in the system. For details, go to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).
- 4 At the CIT, select **VIEW-Rings-OLS Ring Map** command to obtain a report.
- 5 Verify the report information agrees with the local engineering documentation.

END OF STEPS



## DLP-507: Identify Source of Incoming Signal

---

**Overview** You were sent to this procedure to identify the signal source associated with an incoming signal condition so that you can issue a Trouble Report to the personnel at that location.

Incoming HSBB LOL failure

Incoming HSBB LOS failure

Incoming OCH 10G LOF failure

Incoming OCH 10G LOS failure

Incoming OC-48/STM-16 LOF failure

Incoming OC-48/STM-16 LOS failure

Incoming OC-192/STM-64 LOF failure

Incoming OC-192/STM-64 LOS failure

Incoming optical line LOS (loss of signal)

Incoming SUPVY channel fail

**Procedure** **Important!** The source of the incoming signal condition is the upstream network element in the direction of the incoming signal. For example, with **AID 4-2-5 IN-2, INCOMING OC-48 LOS**, the incoming LOS appears on Bay 4, Shelf 2, Slot 5, Port IN-2.

- 
- 1** From office records, determine the location of the upstream network element and send a Trouble Report to the personnel responsible for maintaining that site.

- 
- 2** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS



## DLP-509: Install/Remove Apparatus Blank

**Overview** This procedure describes how to install or remove an apparatus blank.

### Procedure

- 1 Is an apparatus blank to be installed or removed?

| IF...                  | THEN...                                |
|------------------------|----------------------------------------|
| To be <i>installed</i> | Continue with <a href="#">Step 2</a> . |
| To be <i>removed</i>   | Continue with <a href="#">Step 5</a> . |

- 2 Position the apparatus blank vertically with its extended release tabs facing towards you.
- 3 Insert the apparatus blank into the circuit pack slot and push it in until the upper and lower release tabs snap onto the shelf cross-support channels.
- 4 STOP! YOU HAVE COMPLETED THIS PROCEDURE.
- 5 Push down on the upper release tab and pull up on the lower release tab to release the apparatus blank from the shelf cross-support channels.
- 6 Slide the apparatus blank from the slot.

END OF STEPS



## DLP-510: Inspect and Clean Optical Fiber Connectors

---

**Overview** This procedure is used to inspect and clean the optical connectors used in an optical line system. All unused fiber connectors and optical ports must have dust caps at all times to prevent contamination. This minimizes the cleaning effort. Proper inspection and cleaning will eliminate exposure to dirt that may cause permanent damage to the connectors.

Connectors can be damaged when they are engaged or disengaged while significant optical power (greater than 3.0 dBm) is present in the connection. Connectors can also be damaged when they are cleaned while optically powered. Do not engage or disengage connectors while they maintain a significant optical power and do not attempt to clean optically powered connectors.

Once a connector has been permanently damaged, no amount of cleaning will rectify it. A damaged connector is suspected, despite rigorous cleaning, when power remains low in the system. Therefore, proper cleaning is especially critical in high power systems. Typically, both mating ends of the connection is damaged. In the event that damage occurs while engaging or disengaging connectors while significant power is present, the damaged jumper cable and circuit pack should be replaced.



### CAUTION

*SERVICE AFFECTING - This procedure could result in service interruption.*

The following equipment is required:

- CLETOP Cleaning Cassette Type A (Comcode 901375154) or Type B
  - Replacement Reel for CLETOP Cleaning Cassette Type A (comcode 901375014)
  - Replacement Reel for CLETOP Cleaning Cassette Type B
- Individual Pre-saturated Alcohol Wipes - Tech Spray brand, 99% pure anhydrous Isopropyl alcohol (comcode 901375147)

- Optical Fiber Scope, Noyes OFS 300-200X (Comcode 408197028, used for ST, SC, FC, and LC type connectors)
- 1.25 mm (LC) Adapter Cap for Noyes OFS 300-200X (Comcode 408197069)
- 2.50 mm (ST, SC, FC) Adapter cap for Noyes OFS 300-200X (Comcode 408197044).

**Important!** All optical fiber connectors ( ST<sup>®</sup>, SC, FC, and LC types) should be subjected to this procedure before making initial connections or reconnections per the following instructions. Only the connectors being assembled at this particular time should be subjected to this procedure. To prevent contamination, keep all dust caps and plugs in place on the fiber connectors as well as on the lightguide buildouts until it is time to make connections. After cleaning is complete and contamination is suspected, discard lightguide buildouts and/or connectors and replace them with new parts before making fiber connections.

#### **Cleaning Connectors on Optical Jumpers and Pigtails**

- 1 Remove (if necessary) optical connector from lightguide buildout/optical port or remove (if necessary) dust cap from the optical connector. Make sure there is no optical signal present on the optical connector by using an optical power meter or by disconnecting the other end of the fiber.



#### **WARNING**

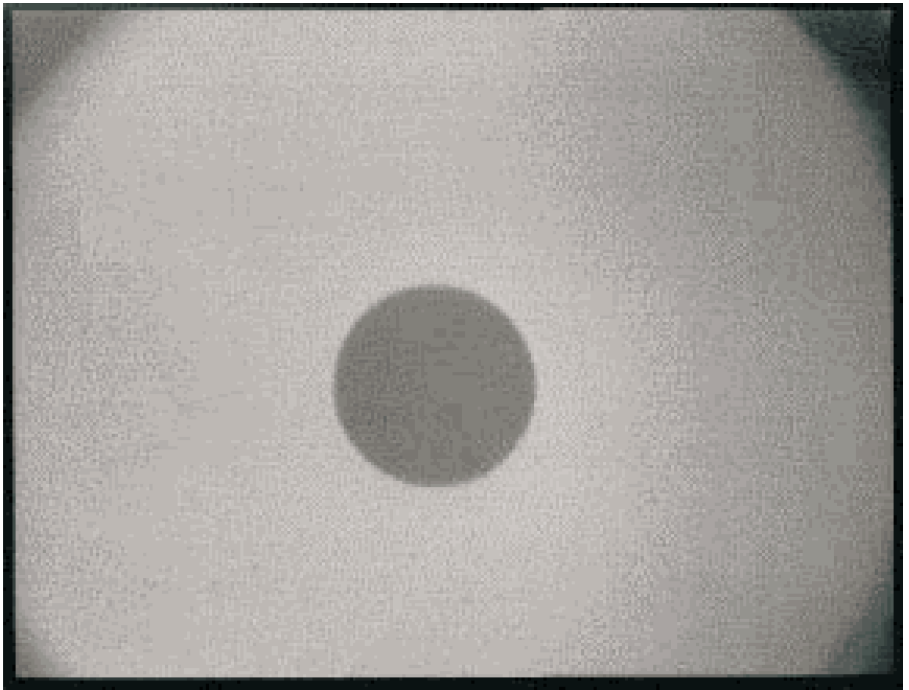
*Disconnected or separated optical connectors may emit invisible laser radiation. Do not view the lightwave beam with the naked eye or with an optical instrument. Avoid direct exposure to the beam.*

2. Verify clean connector by using an appropriate microscope.
  1. Make sure that the viewing area of the microscope itself is free of any spots that might be confused with the spots from a contaminated connector. To verify, look into the microscope eyepiece from a distance of 1 inch without a connector attached to it. The white background displayed by the eyepiece of a clean microscope will be free of black spots and/or rings around its periphery.
  2. Attach the connector into the microscope.
  3. Look for a clean white ferrule tip with a dark circle in the center (fiber cladding and core) by adjusting the focus setting on the microscope. The image on the microscope for a clean connector will be free of any spots, streaks, and fiber particles as shown in [Figure 14-1, “Image of Clean Connector” \(14-15\)](#).  
However, not all connectors may appear perfectly clean even after implementing this cleaning procedure due to permanent features on the connector (fixed particles, ceramic voids, cracks, chips, and other surface irregularities). Refer to [Figure 14-2, “Acceptability Criteria for Single Mode and Multimode Fibers” \(14-18\)](#) to determine that the permanent features on the connector satisfy the visual inspection criteria. If the visual inspection criteria are not satisfied, then the connector is **not** clean and should not be used.



**TIP:** If spots, streaks and fiber particles are observed, it is important to confirm that they are on the connector, and not part of the microscope. Contamination on the connector can be verified by slowly disconnecting the connector while viewing it through the microscope and verifying that the spots, streaks, and fiber particles fade away as the connector is removed from the microscope. If the microscope is contaminated, then replace it with a clean microscope and service the contaminated microscope.

**Figure 14-1 Image of Clean Connector**



- 3 Does the connector satisfy the [Figure 14-2, “Acceptability Criteria for Single Mode and Multimode Fibers” \(14-18\)](#) visual inspection criteria?

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 15</a> . |
| <b>NO</b>  | Continue with <a href="#">Step 4</a> .  |

- .....  
**4** Hold the CLETOP Reel Type A or B cleaner in the palm of one hand with the cleaning side facing you.  
.....
- 5** Press the lever with the thumb of the same hand all the way down and hold. Do not release the lever.  
.....
- 6** While keeping the lever held down with one hand, use the other hand to press the optical ferrule endface against the cleaning cloth in any one slot and uniformly drag it in the direction indicated by the arrows on the cleaner. Note that the CLETOP Reel Type B has only one slot. Make sure that the endface is in contact with the cleaning cloth at all times, and that uniform force is used while dragging it.  
.....
- 7** Rotate the connector 90 degrees.  
.....
- 8** Press the ferrule endface against the cleaning cloth in the other slot for CLETOP Reel Type A or in the same slot for CLETOP Reel Type B and uniformly drag it in the direction indicated by the arrows on the cleaner. Make sure that the endface is in contact with the cleaning cloth at all times, and that uniform force is used while dragging it.  
.....
- 9** Release the lever and allow it to return to its initial position.  
.....
- 10** Verify clean connector by using an appropriate microscope as described in [Step 2](#).  
.....
- 11** Does the connector satisfy the [Figure 14-2, “Acceptability Criteria for Single Mode and Multimode Fibers” \(14-18\)](#) visual inspection criteria?

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 15</a> . |
| <b>NO</b>  | Continue with <a href="#">Step 12</a> . |



## CAUTION

*Alcohol is flammable and is harmful if swallowed, inhaled, or absorbed through the skin. Keep alcohol away from heat, sparks, or flame. Avoid contact with eyes, skin and clothing.*

- 12** Open an individual foil packet of pre-saturate alcohol wipe. Grasp the connector housing and place the connector ferrule endface perpendicular to the alcohol wipe. Drag it against the wipe three times in a figure eight pattern while maintaining uniform pressure. Do not use pre-saturated alcohol wipes other than the type specified in this procedure. Make sure that the pre-saturated alcohol wipe is resting on an unyielding surface while wiping the ferrule tip. Discard pre-saturated alcohol wipe in an appropriate manner when finished.

- 13** Repeat [Step 4](#) through [Step 10](#).

- 14** Does the connector satisfy the [Figure 14-2, “Acceptability Criteria for Single Mode and Multimode Fibers” \(14-18\)](#) visual inspection criteria?

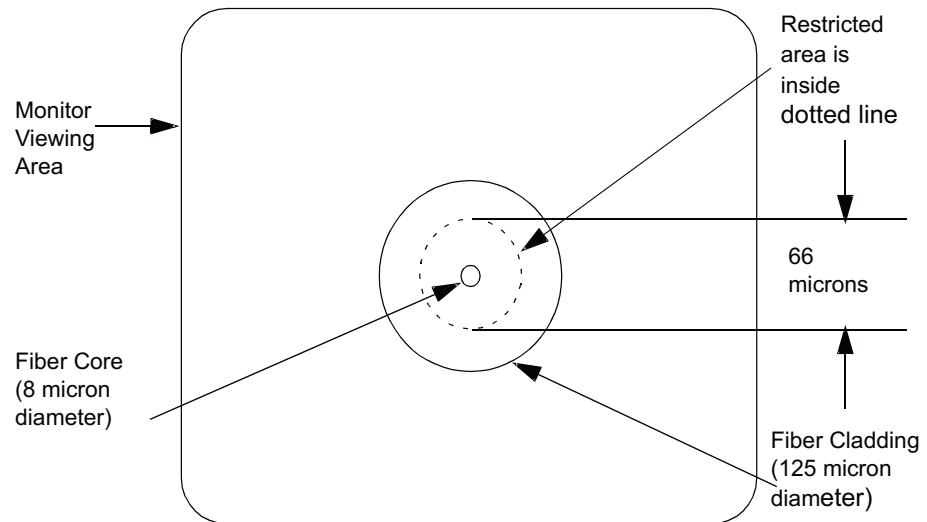
| IF...      | THEN...                                                                                                                                                |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 15</a> .                                                                                                                |
| <b>NO</b>  | Then repeat <a href="#">Step 12</a> . If the connector remains dirty after <a href="#">Step 12</a> as been implemented twice, then discard the jumper. |

- 15** After the connector has been verified to be clean, it should be immediately inserted into the optical port. If the connector is not going to be used, then it must be protected with a clean dust cap. When this connector is to be used, it should be subjected to this procedure again prior to mating it into an optical port.

END OF STEPS

## Definitions

**Figure 14-2 Acceptability Criteria for Single Mode and Multimode Fibers**



**Restricted Area:** A circle with a diameter of 66 microns centered on the fiber core. This diameter is equal to half the sum of the single mode fiber core and fiber cladding diameters.

**Fixed Contamination:** Contamination that cannot be removed, and does not change appearance or location, during or after three cleaning attempts.

**Loose Contamination:** Contamination that can move or change position on the fiber Ferrule Endface. This contamination can be removed in three (or fewer) cleaning attempts.

**Fiber Cladding:** This is the large dark circle near the center of the viewing area. This is the outermost region of the end of the glass fiber.

**Fiber Core:** In single mode fibers, this appears as a small white circle near the center of the Viewing area (in multimode fibers, this circle is much larger). The core may be found at the center of the Fiber Cladding, which appears as a larger circle. The single mode fiber core is approximately 8 microns in diameter and the cladding is approximately 125 microns in diameter.

**Ferrule Endface:** This appears as a light colored area that surrounds the entire Fiber Cladding region. This area may sometimes look rough

or "pebbled," but must be uniform in appearance. The Ferrule Endface fills the entire viewing area outside of the Fiber Cladding.

#### Cleanliness Requirements

- No **loose** contamination or particulate matter of any size is allowed in Viewing Area.
- No contamination, chips, or cracks of any size are allowed with the Restricted Area.
- Fixed Contamination is allowed **only** if it is smaller than the single mode Fiber Core diameter (8 microns), **and** is located outside of the Restricted Area, **and** it cannot be moved or removed in three cleaning attempts.
- Scratches are acceptable**only** if they do not go through the core and are less than 2 microns in width.



# DLP-511: Install/Remove Shelf Cover

**Overview** This procedure describes how to install or remove a shelf cover.



## CAUTION

*Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar® OLS 1.6T system network element to prevent electrostatic discharge damage to sensitive components. See "Electrostatic Discharge (ESD) Considerations" (13-3) in ["TAP-100: Technical Assistance" \(13-6\)](#).*

## Procedure

- 1 Is the cover to be installed/removed a shelf cover or interconnect panel cover?

| IF...                    | THEN...                                                                                             |
|--------------------------|-----------------------------------------------------------------------------------------------------|
| shelf                    | Continue with <a href="#">Step 2</a> .                                                              |
| interconnect panel cover | Go to <a href="#">Step 6</a> of <a href="#">"Install Cover " (14-21)</a> , later in this procedure. |

- 2 Locate the appropriate shelf cover.

- 3 Is the cover being installed or removed?

| IF...            | THEN...                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------|
| <i>removed</i>   | Go to <a href="#">Step 1</a> of <a href="#">"Remove Cover " (14-21)</a> , later in this procedure.  |
| <i>installed</i> | Go to <a href="#">Step 1</a> of <a href="#">"Install Cover " (14-21)</a> , later in this procedure. |

END OF STEPS

**Remove Cover**

---

- 1** At the top of each cover, locate the 1/4 turn screw, which is part of the latch assembly.  

---
- 2** Using an appropriate screwdriver, rotate the 1/4 turn fasteners counterclockwise 90 degrees to unlock each latch handle.  

---
- 3** Pivot each latch handle so it is perpendicular to the front face of the cover.  

---
- 4** Pull on the latch handles to open the cover.  

---
- 5** Lift the cover and push back slightly, lift up the cover to disengage the pins from the metal tabs on the shelf framework, then lift the cover up until it is free from the shelf framing.

---

END OF STEPS

---

**Install Cover**

---

- 1** Position the cover horizontal to the shelf framework, slide the pivot pins in slightly and rotate the bottom of the cover down to engage the metal tabs on the shelf framework.  

---
- 2** Make sure the cover latch handles have been pivoted so they are perpendicular to the front face of the cover. Make sure the 1/4 turn fasteners are rotated to the full counterclockwise position.

**CAUTION**

*Make sure that the cover is flush with the face of the bay before attempting to secure the fasteners.*

**CAUTION**

*Be careful not to damage or crush the fibers while installing the shelf cover.*

- 3 Close the cover and rotate the latch handles flush with the cover. Then, using a flat-blade screwdriver, rotate the 1/4 turn fasteners clockwise approximately 90 degrees.

- 4 Using an appropriate screwdriver, rotate the 1/4 turn screw clockwise 90 degrees to lock the latch handle.

- 5 ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***

- 6 Is the cover being installed or removed?

| IF...     | THEN...                                 |
|-----------|-----------------------------------------|
| removed   | Continue with <a href="#">Step 7</a> .  |
| installed | Continue with <a href="#">Step 11</a> . |

- 7 Locate the screw in the middle of the upper edge.

- 8 Using an appropriate screwdriver, turn the screw counter-clockwise until screw threads are disengaged.

- 9 Grasp cover by upper corners, pull forward and lift up to remove cover.



.....

**10**    ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***

.....

**11**    Grasp cover by upper corners.

.....

**12**    Place bottom of cover into lower rail of interconnect panel and push closed.

.....

**13**    Using an appropriate screwdriver, turn clockwise until screw engages frame.

.....

END OF STEPS

.....



# DLP-512: Install/Remove Lightguide Buildout

---

## Procedure



### WARNING

*Unterminated optical connectors may emit invisible laser radiation. Eye damage may occur if beam is viewed directly or with improper optical instruments. Avoid direct exposure to beam.*



### CAUTION

*Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar OLS 1.6T User/Service Manual (U/SM) network element to prevent electrostatic discharge damage to sensitive components.*

**Important!** Refer to the chapter Orderable Equipment - Comcodes by Item Name, or Orderable Equipment by Comcode, in the *WaveStar® OLS 1.6T Applications and Planning Guide*, (365-575-713R6.2) for the values of LBOs.

- 
- 1 Is the buildout being installed or removed? For details, see [Figure 14-3, “Duplex LC block and Connector” \(14-26\)](#) and [Figure 14-4, “Simplex LC Block and Connector” \(14-27\)](#)

| IF...            | THEN...                                                                      |
|------------------|------------------------------------------------------------------------------|
| <i>installed</i> | Go to <a href="#">“Install Buildout ” (14-25)</a> , later in this procedure. |
| <i>removed</i>   | Go to <a href="#">“Remove Buildout” (14-25)</a> , later in this procedure.   |

END OF STEPS

---

### Install Buildout

---

- 1 Remove the protector caps and plugs (if equipped) from the buildout and buildout block and store them in a clean container.
- 2 Align the buildout with the slot in the buildout block, push in until it locks into position.

END OF STEPS

---

### Remove Buildout



#### CAUTION

*Locking tab must only be pushed along a line perpendicular to buildout body in direction towards the buildout in order to avoid damage to the locking beam.*

---

- 1 Depress the locking tab on the buildout and separate from the buildout block by sliding apart.

END OF STEPS

---

**Figure 14-3 Duplex LC block and Connector**

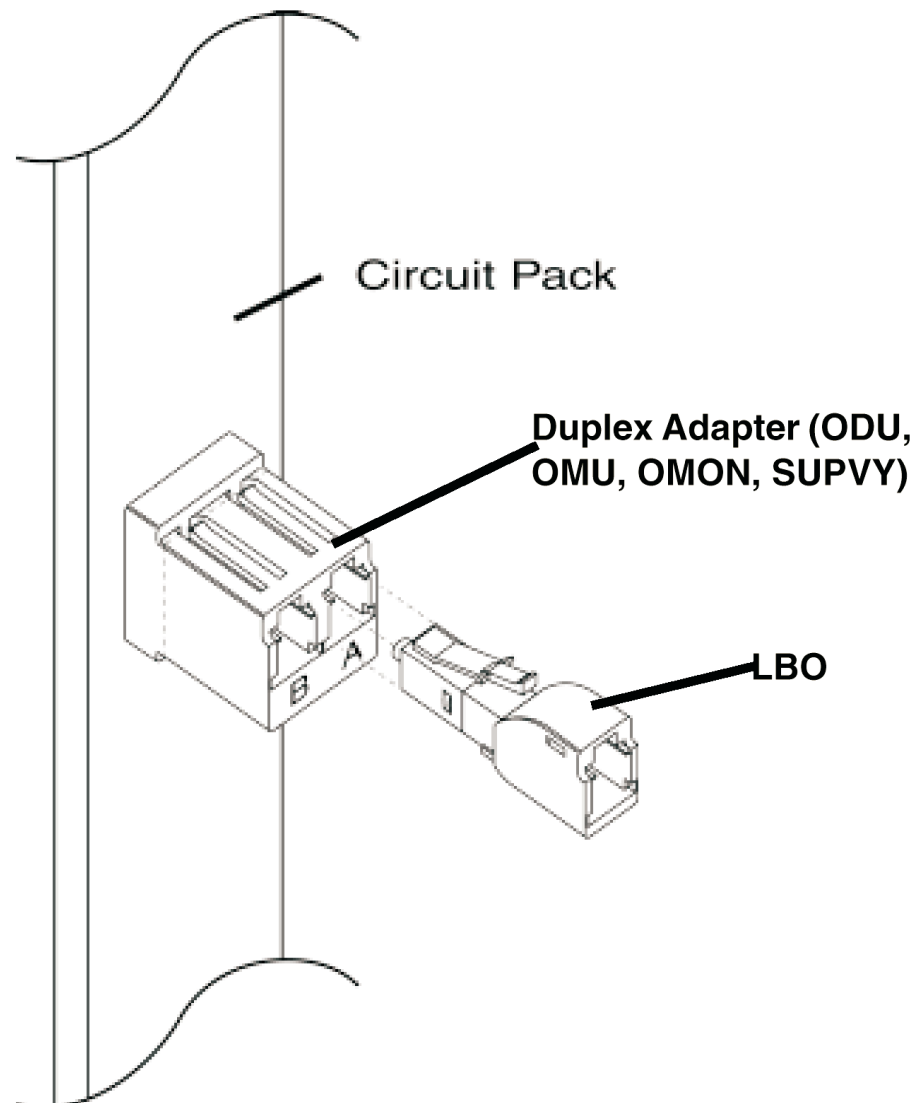
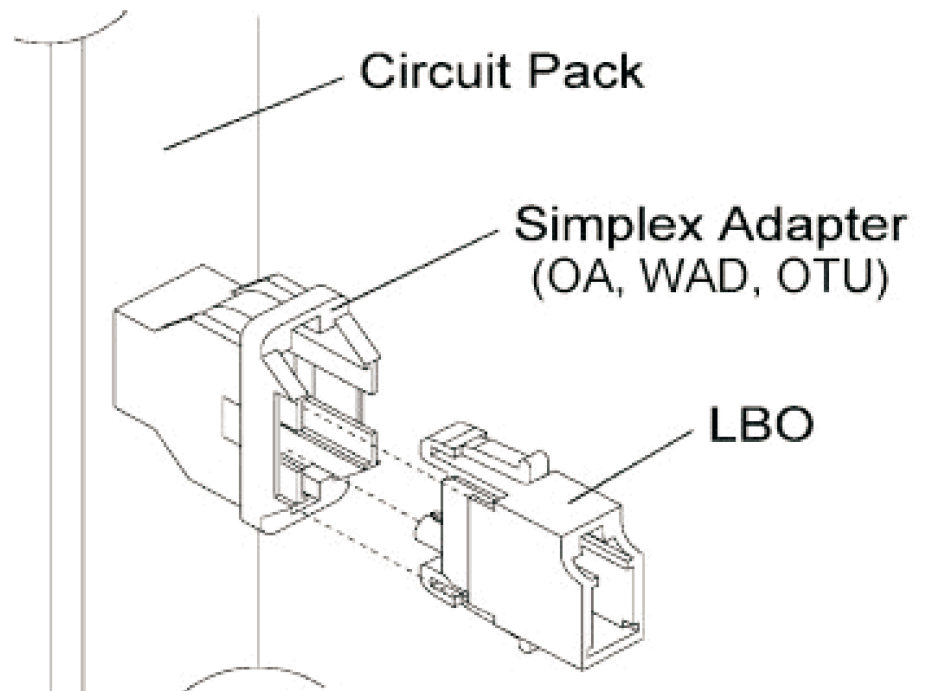


**Figure 14-4 Simplex LC Block and Connector**



□

## DLP-514: Remove and/or Install Circuit Pack

---

**Overview** This procedure describes how to install and/or remove circuit packs or apparatus units.

Refer to the *WaveStar® OLS 1.6T Installation Manual*, (365-575-717R6.2) and office records to identify pre-installed and labeled fibers in the bay that connect to various circuit pack slots or apparatus unit slots.



### CAUTION

*During initial software installation and when circuit packs are inserted into a running system, there will be an automatic upgrade of the firmware on the circuit packs to the latest version. Flashing green LEDs on the circuit pack faceplates will indicate that the upgrade is occurring (typically less than 30 seconds). Please DO NOT remove the circuit pack during this upgrade because it may cause damage to the affected pack. After the pack LEDs stop flashing it is then safe to remove the packs or power down the system as needed.*



### CAUTION

*Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar® OLS 1.6T network element to prevent electrostatic discharge damage to sensitive components.*

**Important!** When removing and inserting circuit packs, keep the pack out of the slot for 60 seconds.

**Procedure**                      **Important!** Verify that all fibers are labeled to prevent possible service interruption.

- 1 What type of circuit pack, CLSC or DCM apparatus unit, is being removed and/or installed?

| IF...                                 | THEN...                                                                                         |
|---------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>ODU or WAD</b>                     | Continue with Step 2.                                                                           |
| <b>OA, OMON, OMU, ORS, OTU, SUPVY</b> | Continue with Step 4.                                                                           |
| <b>BOS or EI</b>                      | Go to <a href="#">“Remove BOS or EI circuit pack.” (14-34)</a> , later in this procedure.       |
| <b>BOS-SYSCTL</b>                     | Go to <a href="#">“BOS-SYSCTL circuit pack ” (14-35)</a> , later in this procedure.             |
| <b>DCM</b>                            | Go to <a href="#">“Remove/Install a DCM apparatus unit” (14-37)</a> , later in this procedure.  |
| <b>CLSC</b>                           | Go to <a href="#">“Remove/Install a CLSC Apparatus Unit” (14-38)</a> , later in this procedure. |

- 2 Before disconnecting any fiber jumpers, locate the OA that is connected to the IN port of the failed ODU or WAD circuit pack. The Receive OA should be located in 1–1–5 (Bay, Shelf, Slot). However, verify this by checking the fiber designation tags wrapped around the fiber.

- 3 Disengage the OA circuit pack identified in Step 2 from the shelf as follows: Push up on the bottom and down on the top locking clips to unlock the circuit pack latches. Disengage the circuit pack by carefully and continuously pulling out equally on the top and bottom latches. Continue with Step 4.

- 4 Are you to remove or install an **OA, ODU, OMON, OMU, ORS, OTU, SUPVY, or WAD** circuit pack?

| IF...                 | THEN...                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------|
| <b><i>remove</i></b>  | Go to <a href="#">“Remove an OA, ODU, OMON, OMU, ORS, OTU, SUPVY, or WAD circuit pack” (14-30).</a> |
| <b><i>install</i></b> | Go to <a href="#">“Install an OA, ODU, OMON, OMU, ORS, OTU, SUPVY, or WAD circuit pack” (14-31)</a> |

END OF STEPS



## WARNING

*Unterminated optical connectors may emit invisible laser radiation. Eye damage may occur if beam is viewed directly or with improper optical instruments. Avoid direct exposure to the beam.*

### Remove an OA, ODU, OMON, OMU, ORS, OTU, SUPVY, or WAD circuit pack

- 1 Disengage the circuit pack from the appropriate shelf as follows:
  1. Push up on the bottom and down on the top locking clips to unlock the circuit pack latches.
  2. Disengage the circuit pack by carefully and continuously pulling out equally on the top and bottom latches.
  3. Remove the fiber(s) from the appropriate port(s) listed for the circuit pack(s) in [Table 14-2, “Circuit Packs/Apparatus Units and Ports” \(14-39\).](#)
  4. Drape the removed fibers so as not to interfere with the circuit pack(s) removal.
  5. Carefully slide the circuit pack out of the slot guides to remove it from the shelf. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.

- 2 Are you to install another circuit pack in this slot?



| IF...      | THEN...                                                                                                                         |
|------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">Step 2</a> of <a href="#">“Install an OA, ODU, OMON, OMU, ORS, OTU, SUPVY, or WAD circuit pack” (14-31)</a> . |
| <b>NO</b>  | Continue with <a href="#">Step 3</a>                                                                                            |

**Important!** When a slot has no circuit pack in place an apparatus blank must be installed in lieu of the circuit pack to provide the correct level of cooling.

- 3 Install an apparatus (circuit pack) blank(s) in the slot(s). For details, go to [“DLP-509: Install/Remove Apparatus Blank” \(14-11\)](#).

- 4 Remove any LBOs from the circuit pack removed in [Step 1](#) and store for future use.

END OF STEPS

### Install an OA, ODU, OMON, OMU, ORS, OTU, SUPVY, or WAD circuit pack

- 1 If required, remove the apparatus (circuit pack) blank from this slot. For details, go to [“DLP-509: Install/Remove Apparatus Blank” \(14-11\)](#).

- 2 Obtain a circuit pack with the same or higher series number, or if adding channel as required per circuit order.

- 3 Open both latches on the circuit pack.

- 4 Place the circuit pack into the slot guides and slowly slide it into the shelf until the latches touch the shelf. **DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.**

- 5 Was an OTU installed?

| IF...      | THEN...                        |
|------------|--------------------------------|
| <b>YES</b> | Go to <a href="#">Step 6</a> . |
| <b>NO</b>  | Go to <a href="#">Step 9</a>   |

- 6 With a thumb on each latch, continue sliding the circuit pack with one firm, continuous motion until the latches are fully engaged and the clips are in the locked position.

- 7 Is this a new or replacement OTU?

|                    |                                 |
|--------------------|---------------------------------|
|                    |                                 |
| <b>new</b>         | Go <a href="#">Step 8</a> .     |
| <b>replacement</b> | Go to <a href="#">Step 10</a> . |

- 8 At the CIT, select **CONFIGURATION-Circuit Connections** and use the circuit connection wizard to add the required associations for the circuit pack being added.

- 9 Was an OA installed?

| IF...      | THEN...                                                                      |
|------------|------------------------------------------------------------------------------|
| <b>YES</b> | Go to <a href="#">Step 10</a> .                                              |
| <b>NO</b>  | Go to <a href="#">Step 11</a> (for ODU, OMON, OMU, ORS, OTU, SUPVY, or WAD). |

- 10 Determine the required LBO. For details, go to [“DLP-528: LBO Application” \(14-59\)](#).

- 11 Clean the optical fiber(s) and connector(s). For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- 12 Connect the optical fiber(s) to the required ports. For details, go to [Table 14-2, “Circuit Packs/Apparatus Units and Ports” \(14-39\)](#).

- .....
- 13** Dress the fiber(s) at the slot guide to ensure fiber(s) do not interfere with the circuit packs insertion.
- .....

- 14** Was an OTU installed?

| IF...      | THEN...                                                                     |
|------------|-----------------------------------------------------------------------------|
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b>                      |
| <b>NO</b>  | Go to <a href="#">Step 15</a> (for OA, ODU, OMON, OMU, ORS, SUPVY, or WAD). |

.....

- 15** With a thumb on each latch, continue sliding the circuit pack with one firm, continuous motion until the latches are fully engaged and the clips are in the locked position.
- .....

- 16** Was an ODU or WAD installed?

| IF...      | THEN...                                       |
|------------|-----------------------------------------------|
| <b>YES</b> | Go to <a href="#">Step 17</a> .               |
| <b>NO</b>  | Go to Step 18 (for OA, OMON, OMU, ORS, SUPVY) |

.....

- 17** Reseat the OA associated with the installed ODU or WAD circuit pack.
- .....

- 18** Was an OMU installed?

| IF...      | THEN...                         |
|------------|---------------------------------|
| <b>YES</b> | Go to <a href="#">Step 19</a> . |
| <b>NO</b>  | Go to <a href="#">Step 20</a> . |

.....

- 19** Determine the required LBO. For details, go to [“DLP-528: LBO Application” \(14-59\)](#).

20 Was a SUPVY installed?

| IF...      | THEN...                                         |
|------------|-------------------------------------------------|
| <b>YES</b> | Proceed to <a href="#">Step 21</a> .            |
| <b>NO</b>  | <b>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</b> |

21 See the NAVIS™ Optical EMS R9.0 Provisioning Ordering Guide, for the procedure to manually initiate and schedule Dynamic Network Operation (DNO).

**STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

END OF STEPS

**Remove BOS or EI circuit pack.**



**CAUTION**

*Do not remove the BOS circuit pack in the SYSCTL slot unless instructed to do so by the procedure that sent you here. If the BOS circuit pack is removed from the SYSCTL slot, provisioning data will be lost from the SYSCTL but will be retained by the FLASH Memory Module that you removed in the procedure that sent you here.*

1 Are you to remove or install a BOS or EI circuit pack?

| IF...          | THEN...                                                                                   |
|----------------|-------------------------------------------------------------------------------------------|
| <b>remove</b>  | Continue with <a href="#">Step 2</a> .                                                    |
| <b>install</b> | Go to <a href="#">“Install BOS or EI circuit pack” (14-35)</a> , later in this procedure. |

- 
- 2 Disengage the circuit pack from the appropriate shelf as follows:
    1. Push up on the bottom and down on the top locking clips to unlock the circuit pack latches.
    2. Disengage the circuit pack by carefully and continuously pulling out equally on the top and bottom latches.
    3. Carefully slide the circuit pack out of the slot guides to remove it from the shelf. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.

END OF STEPS

---

### Install BOS or EI circuit pack

---

- 1 Install the circuit pack as follows:
  1. Open both latches on the circuit pack.
  2. Place the circuit pack into the slot guides and slowly slide it into the shelf until the latches touch the shelf. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.
  3. With a thumb on each latch, continue sliding the circuit pack with one firm, continuous motion until the latches are fully engaged and the clips are in the locked position.

END OF STEPS

---

### BOS-SYSCTL circuit pack

---

- 1 Are you ready to remove or install a BOS-SYSCTL circuit pack?

| IF...          | THEN...                                                                    |
|----------------|----------------------------------------------------------------------------|
| <i>remove</i>  | Continue with <a href="#">“Remove a BOS-SYSCTL circuit pack ” (14-36).</a> |
| <i>install</i> | Continue with <a href="#">“Install a BOS-SYSCTL” (14-37).</a>              |

END OF STEPS

---

### Remove a BOS-SYSCTL circuit pack

---

- 1 At the CIT, click on Configuration-Provision.  

---
- 2 Click on bay, where the BOS ( ) SYSCTL (CP 10) is located.  

---
- 3 Click on shelf, where the BOS ( ) SYSCTL (CP 10) is located.  

---
- 4 Click on the SYSCTL [(CP10) BOS ( )] circuit pack.  

---
- 5 Click on the **PROVISION** button.  

---
- 6 Select **Enable for the FMM Removal**.  

---
- 7 Click on the **Apply** button.  

---
- 8 When the FAULT LED flashes, push the eject button above the SYSMEM slot of the SYSCTL circuit pack to eject the FLASH Memory Module from the SYSCTL circuit pack.  

---
- 9 Disengage the circuit pack from the appropriate shelf as follows:
  1. Push up on the bottom and down on the top locking clicks to unlock the circuit pack latches.
  2. Disengage the circuit pack by carefully and continuously pulling out equally on the top and bottom latches.
  3. Carefully slide the circuit pack out of the slot guides to remove it from the shelf. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.

END OF STEPS

---

### Install a BOS-SYSCTL

---

- 1 Install the circuit pack as follows:
  1. Open both latches on the circuit pack.
  2. Place the circuit pack into the slot guides and slowly slide it into the shelf until the latches touch the shelf. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.
  3. With a thumb on each latch, continue sliding the circuit pack with one firm, continuous motion until the latches are fully engaged and the clips are in the locked position.
  4. Insert the FLASH Memory Module (FMM), removed in [Step 8](#) of [“Remove a BOS-SYSCTL circuit pack” \(14-36\)](#) into the SYSMEM slot of the BOS-SYSCTL circuit pack until it is flush with the BOS-SYSCTL circuit pack faceplate.

END OF STEPS

---

### Remove/Install a DCM apparatus unit

---

- 1 Identify the correct DCM apparatus unit to be removed.

---
- 2 Locate the correct fiber jumpers to the DCM from the assigned OA. Log on a piece of paper the correct jumper assigned to the DCM IN and OUT connections.

---
- 3 Remove the fiber jumpers from the IN and OUT connections of the DCM.

---
- 4 Drape the removed fibers so as not to interfere with the DCM removal.

---
- 5 Loosen the two screws holding the DCM in place by turning them counter clockwise with a flat bladed screwdriver.

---
- 6 Remove the defective DCM.

- 7 Obtain a replacement DCM with the correct DCM series.
- 8 Orient and insert the new DCM into the shelf tray.
- 9 Tighten the screws holding the DCM in place by turning the screws clockwise.
- 10 Clean the optical fibers and connectors. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- 11 Reconnect the fibers (removed in [Step 3](#)) to the correct IN and OUT connections of the DCM.

END OF STEPS

### Remove/Install a CLSC Apparatus Unit

- 1 Remove the fibers from the appropriate port(s) listed for the apparatus unit in [Table 14-2, “Circuit Packs/Apparatus Units and Ports” \(14-39\)](#).
- 2 Drape the removed fibers so as not to interfere with the CLSC removal.
- 3 Push up on the bottom and down on the top locking tabs to unlock the apparatus unit.
- 4 Carefully slide the apparatus unit out of the slot guides to remove it from the shelf.
- 5 Obtain a replacement CLSC apparatus unit with the correct CLSC series.



- 
- 6 Push up on the bottom and down on the top locking tabs to slide the CLSC apparatus unit into the shelf.
- 
- 7 Clean the optical fibers and connections. For details go to DLP-510: Inspect and Clean Optical Fiber Connectors.
- 
- 8 Reconnect the optical fibers removed in Step 1 to the required ports.
- 
- 9 STOP! YOU HAVE COMPLETED THIS PROCEDURE.  
END OF STEPS
- 

[Table 14-2, “Circuit Packs/Apparatus Units and Ports” \(14-39\)](#) provides a listing of circuit packs and their respective ports.

**Table 14-2 Circuit Packs/Apparatus Units and Ports**

| <i>Circuit Packs/ Apparatus Units</i> | <i>Ports</i>                                             | <i>Notes</i> |
|---------------------------------------|----------------------------------------------------------|--------------|
| BOS ( )                               | SYSMEM                                                   |              |
| DCM Apparatus Unit                    | IN, OUT                                                  |              |
| EI1                                   | CIT                                                      |              |
| OA1,OA2, OA3L                         | IN,OUT,DCM IN,DCM OUT,MON TX,MON RX,OMON, SUP TX, SUP RX |              |
| ODU1                                  | IN,OUT 9190 through OUT 9580,OUT 50G2,OUT 50G3           | 1            |
| ODU2                                  | IN 50G2,OUT 9190 through OUT 9385                        | 1            |
| ODU3                                  | IN 50G3,OUT 9390 through OUT 9585                        | 1            |
| OMON1                                 | IN 1 through IN 8                                        |              |
| OMU1                                  | IN 9190 through IN 9580, IN 50G, OUT 1, OUT 2            | 1            |

**Table 14-2 Circuit Packs/Apparatus Units and Ports (continued)**

|                                   |                                                                                                                                 |   |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---|
| OMU2                              | IN 9195 through IN 9585, OUT 50G                                                                                                | 1 |
| ORS                               | C1 IN, C1 OUT, C2 IN, C2 OUT, 1A IN, 1A OUT, 2A IN, 2A OUT, 1B IN, 1B OUT, 2B IN, 2B OUT, ET1, ET1 OUT                          |   |
| OTU1                              | xxxx IN1, xxxx OUT, yyyy IN2, yyyy OUT                                                                                          | 2 |
| OTU10                             | xxxx IN1, xxxx OUT, yyyy IN2, yyyy OUT                                                                                          | 2 |
| OTUD1,OTUD2                       | 0001 IN1, 0001 OUT, 0002 IN2, 0002 OUT                                                                                          |   |
| OTUD10                            | 0001 IN1, 0001 OUT, 0002 IN2, 0002 OUT                                                                                          |   |
| OTU70                             | OUT xxxx, IN 1234, OUT 1234, IN                                                                                                 |   |
| SUPVY()                           | IN 1, IN 2, OUT 1, OUT 2                                                                                                        |   |
| WAD1,WAD2, WAD3, WAD4, WAD5, WAD6 | ADD IN, ADD OUT, DROP IN, DROP OUT, LOOP IN, LOOP OUT, www IN, xxxx IN, yyyy IN, zzzz IN, www OUT, xxxx OUT, yyyy OUT, zzzz OUT |   |
| CLSC Apparatus Unit               | IN C, L, OUT C, L, C+L IN, OUT, IN C1, C2, IN L1, L2, OUT C1, C2, OUT L1, L2, C+L1, IN, OUT, C+L2, IN, OUT                      |   |

**Notes:**

1. The 4-digit component of the port name is the same as the middle four digits of the frequency in THz. For example, the ports associated with the 191.950 THz frequency are IN 9195 (on the OMU) and OUT 9195

(on the ODU).

2. xxxx and yyyy are the same as the middle four digits of the frequency in THz. For example, the ports associated with the 191.950 THz frequency are IN 9195 and OUT 9195.
3. wwwwww, xxxx, yyyy, and zzzz are the same as the middle four digits of the frequency in THz. For example, the ports associated with the 191.950 THz frequency are IN 9195 and OUT 9195.



## DLP-517: Inspect Optical Fiber(s)

---

**Overview** This procedure is used to correct an input or output fiber problem such as a damaged or disconnected fiber.

Refer to the *WaveStar® OLS 1.6T Installation Manual*, (365-575-790R6.2) and office records to identify pre-installed and labeled fibers in the bay that connect to various circuit pack slots.

### Procedure



#### CAUTION

*SERVICE AFFECTING - This procedure could result in service interruption.*

---

- 1 If required, remove the appropriate shelf covers. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- 2 Verify the fibers are properly connected.
- 3 Visually inspect the fiber, starting at the connector on the local network element and going as far as practical (usually to an interconnection bay or to a cross-connect panel).
- 4 Correct any problems with the fiber, following local procedures.
- 5 Reinstall the shelf covers. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

END OF STEPS



# DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT

**Overview** This procedure is used to initiate or terminate a login session to a network element (NE).

## Procedure

- 1 Are you initiating or terminating a login session?

| IF...              | THEN...                                                              |
|--------------------|----------------------------------------------------------------------|
| <i>initiating</i>  | Continue with <a href="#">“Initiate a Login Session ” (14-43)</a> .  |
| <i>terminating</i> | Continue with <a href="#">“Terminate a Login Session ” (14-44)</a> . |

END OF STEPS

## Initiate a Login Session

- 1 If required, connect and condition the craft interface terminal (CIT). For details, go to [“DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)” \(14-5\)](#).

- 2 Click on the task bar labeled **WaveStar CIT**.

**Important!** See the CIT tutorial available on the WaveStar® OLS 1.6T CD-ROM for examples of screens showing a successful login session.

- 3 Click on the folder labeled **Most Recent** or **Saved View**.

- 4 Is the desired TID displayed?

| IF...      | THEN...                                                 |
|------------|---------------------------------------------------------|
| <b>YES</b> | Select the TID with the mouse pointer and double click. |

| IF... | THEN...                                                                                                                                                                                                                                                                                                    |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NO    | <ol style="list-style-type: none"><li>1. Click on Saved Views.</li><li>2. Click on View 1.</li><li>3. Right-click on View 1.</li><li>4. Select New</li><li>5. Select New NE and click.</li><li>6. In the new NE dialog box; enter the required data.</li><li>7. Click on OK to create a new TID.</li></ol> |

- .....
- 5 Type your assigned User ID and press the tab key to advance to the next field.
- .....
- 6 Type your assigned password and click on **OK**.

.....

END OF STEPS

.....

**Terminate a Login Session**

.....

- 1 Click on the task bar labeled with the TID login session to be terminated.
- .....
- 2 At the WaveStar® OLS 1.6T CIT, select **FILE-NE Disconnect** and click on **NE Disconnect**.

.....

END OF STEPS

.....



# DLP-519: Modify, Disable, Enable or Add a User's Login and/or Password

---

**Overview** This procedure covers login aging and password aging in addition to changing, deleting, or entering a user's login. Additional information about security and aging is provided in "Security Administration" (1-1).

## Procedure



### CAUTION

*Privileged users cannot change their own login. (LUC01 and LUC02 are the original super user names.)*

---

- 1 If required, connect and condition the craft interface terminal (CIT). For details, go to ["DLP-501: Connect and Condition Craft Interface Terminal \(CIT\)" \(14-5\)](#).

---

- 2 If required, initiate a login session with the appropriate network element, refer to ["DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT" \(14-43\)](#). You must have an NE login with appropriate UAP (User Access Privilege) to perform these tasks:

| IF...                                     | THEN...                                                                 |
|-------------------------------------------|-------------------------------------------------------------------------|
| <i>adding or modifying a user's login</i> | Continue with <a href="#">"Add or Modify User Login " (14-46)</a> .     |
| <i>disabling a user login</i>             | Continue with <a href="#">"Disable User Login " (14-46)</a> .           |
| <i>enabling a user login</i>              | Continue with <a href="#">"Enable User Login " (14-47)</a> .            |
| <i>enabling/disabling login aging</i>     | Continue with <a href="#">"Enable/Disable Login Aging" (14-47)</a> .    |
| <i>enabling/disabling password aging</i>  | Continue with <a href="#">"Enable/Disable Password Aging" (14-47)</a> . |

| IF...                            | THEN...                                                          |
|----------------------------------|------------------------------------------------------------------|
| <i>entering/editing password</i> | Continue with <a href="#">“Enter or Edit Password” (14-48)</a> . |

END OF STEPS

### Add or Modify User Login

- 1 At the CIT, select **ADMINISTRATION-Security-User Provisioning** and select new user if adding a new user or existing user if modifying user login.

- 2 Enter the appropriate new or modified user data in the specified fields.

- 3 Click the **Add** or **Modify** button as appropriate.

END OF STEPS

### Disable User Login

- 1 At the CIT, select **ADMINISTRATION-Security-Disable User Login**.

- 2 Click on the User Login to be disabled.

- 3 Click on the **Disable** button.

END OF STEPS



### **Enable User Login**

- 1 At the CIT, select **ADMINISTRATION-Security-Enable User Login**.
- 2 Click on the User Login to be enabled.
- 3 Click on the **Enable** button.

END OF STEPS

### **Enable/Disable Login Aging**

- 1 At the CIT, select **ADMINISTRATION-Security-Security Provisioning**.
- 2 Select the appropriate data fields for desired action.
- 3 Once data has been selected click on the appropriate button.

END OF STEPS

### **Enable/Disable Password Aging**

- 1 At the CIT, select **ADMINISTRATION-Security-User Provisioning**.
- 2 In the password aging box select the appropriate data fields for desired action.
- 3 Once data has been selected click on the appropriate button.

END OF STEPS

**Enter or Edit Password**

- .....
- 1** At the CIT, select **ADMINISTRATION-Security-User Provisioning**.

- .....
- 2** Select existing User.

- .....
- 3** Enter appropriate password data in Password box fields.

- .....
- 4** Once data has been selected click on the appropriate button.

.....

END OF STEPS



## DLP-522: Replace Power Line Filter

---

**Overview** Follow the procedure below to replace a power line filter.

**Procedure** .....

- 1 Identify the correct power filter to be removed.

**Important!** Verify that **all** –48 fuse/breakers (including any alarm fuses) supplying power to both the **A** and **B** feeds are the correct size and are intact. Using a Multimeter on the Volts setting, measure the voltage across the Main fuse/circuit breaker for ALL A and B feeds to the equipment. If the reading across any breaker/fuse is more than 1V, the supply must be repaired before any Power Filters can be replaced. Refer to the Powering chapter of the WaveStar® OLS 1.6T (400G/800G) Installation Manual for help.

.....

- 2 Before replacing a failed power filter, verify that a proper ground has been established between the shelf and ground. This is accomplished by measuring the resistance between the –48 V return of the power feed going into the Power filter (return is identified by striping) and the frame ground jack for that particular shelf (use the ESD ground jack for that shelf) using an Analog Volt-Ohm Meter (VOM). The acceptable value is one Ohm or less.

**Important!** Most digital VOMs will be adversely affected by ground currents/noise and are not a good choice in this measurement.

.....

- 3 Set the circuit breaker on the replacement filter to the off position.
- .....

- 4 Remove the shelf cover. For details refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- .....

- 5 If equipped, remove the interconnect panel cover on the power filter shelf. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 6 Unplug the filters power cable by depressing both tabs at the same time and pulling the connector from the filters socket.
- 7 Loosen the screw holding the filter to its holding bracket using a flat-bladed screwdriver.
- 8 Remove the defective filter by sliding it out towards the front of the shelf.

**WARNING**

*When inserting a power filter into the shelf, ensure that the plastic power connector on the filter clears the power filters screw bracket. This will prevent damage to the plastic power connector.*

- 9 Orient and insert the new filter.
- 10 Using a flat screwdriver, tighten the screw holding the filter into its holding bracket, to ensure proper shelf grounding..
- 11 Set the circuit breaker on the replacement filter to the off position.
- 12 Reconnect the power plug to the filters socket (keyed to ensure proper insertion).
- 13 Set the circuit breaker on the replacement filter to the on position. If the trouble does not clear, contact the appropriate maintenance organization for further technical support.
- 14 Reinstall shelf covers. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

END OF STEPS



## DLP-524: Connect Optical Power Meter for Measurement at OTU () IN () Port

---

**Overview** This procedure provides tables for determining the correct power level and lightguide buildout (LBO) values for the OTU () IN () port when connected to a WaveStar® OLS 1.6T system terminal or other vendor equipment ([Figure 14-5, “Location of LBOs at OTU \(One Direction\)” \(14-55\)](#)).

### Required Equipment

- Wrist Strap
- Optical Power Meter

### Procedure



### CAUTION

*Use a static ground wrist strap whenever handling units or circuit packs to prevent electrostatic discharge damage to sensitive components. See Electrostatic Discharge (ESD) Considerations (13-3) in "TAP-100: Technical Assistance" (13-3).*

**Important!** This procedure uses OTU in general terms, meaning that it also refers to an OTUD.

- 
- 1 If necessary, remove the appropriate shelf cover. All connections can be accessed from the front. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- 

- 2 Are you adding or trouble clearing an OTU?

| IF...                   | THEN...                                 |
|-------------------------|-----------------------------------------|
| <i>adding</i>           | Continue with <a href="#">Step 3</a> .  |
| <i>trouble clearing</i> | Continue with <a href="#">Step 10</a> . |

- .....  
**3** Remove the protector cap and clean the fiber that will be connected to the OTU IN () port. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).  
.....
- 4** Connect the optical power meter to the incoming fiber from the ODU OUT () port or from the downstream network element cleaned in [Step 3](#) and obtain an optical power measurement.  
.....
- 5** Using the power level reading obtained in [Step 4](#) and [Table 14-3, “OTU Input Power Range” \(14-54\)](#), compute the required LBO for the IN connector of the OTU() IN () port.  
.....

**Important!** If measured power level is greater than the Recommended Input Power level for a given type OTU() install an LBO with a value that will bring power level to near the Recommended Input Power level. For example, with a OC48/STM16 Optical Channel if the measured power level is -7 dBm then install a 10 dBm LBO.

- 6** Clean the OTU() IN(), port, LBO and both ends of the optical fiber that will be used to connect the ports. For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).  
.....
- 7** Install the LBO into the IN() connector of the OTU(). For details, go to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).  
.....
- 8** Connect the optical fiber jumper between the OTU() IN () and ODU OUT () ports or OTU IN () port and OUT port of an upstream network element.  
.....
- 9** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***  
.....



## CAUTION

*Make sure the protection facilities are available or that the troubled optical channel on this OTU has been manually switched to protection.*



## CAUTION

*Make sure incoming fibers are not carrying service.*

- 10 Remove the fiber jumper connected to the IN connector of the OTU() involved in this trouble.
- 11 Connect the optical power meter to the fiber jumper removed from the IN() connector of the OTU() in [Step 10](#) and obtain an optical power measurement.
- 12 Using the power level reading obtained in [Step 11](#) and the appropriate row of [Table 14-3, "OTU Input Power Range" \(14-54\)](#), determine if the power level is within range.

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 13</a> . |
| <b>NO</b>  | Continue with <a href="#">Step 17</a> . |

- 13 Using the power level reading obtained in [Step 11](#) and [Table 14-3, "OTU Input Power Range" \(14-54\)](#), compute the required LBO for the IN() port of the OTU.

**Important!** If measured power level is greater than the Recommended Input Power level for a given type OTU() install an LBO with a value that will bring power level to near the Recommended Input Power level. For example, with an OC-48/STM-16 Optical Channel if the measured power level is -7 dBm then install a 10 dBm LBO.

If measured power level is less than the recommended input power, but within the input power range, equip with a 0 dBm LBO.

- 14 Using the calculated LBO value obtained in [Step 13](#), determine if the LBO installed in the OTU() IN () port is the correct value.

| IF... | THEN...                                 |
|-------|-----------------------------------------|
| YES   | Continue with <a href="#">Step 17</a> . |
| NO    | Continue with <a href="#">Step 15</a> . |

- 15 Clean the OTU() IN () port, LBO and optical fiber jumper connector that was disconnected in [Step 10](#). For details, refer to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- 16 Install the new LBO in the OTU() IN () port. For details, refer to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).

- 17 Reconnect the optical fiber jumper removed in [Step 10](#) to the OTU() IN () port.

END OF STEPS

Refer to [Table 14-3, “OTU Input Power Range” \(14-54\)](#) for OTU Input Power Levels.

**Table 14-3 OTU Input Power Range**

| OTU TYPE              | CP CODE | Input Power Range | Recommended Input Power |
|-----------------------|---------|-------------------|-------------------------|
| OC-48/STM-16 /ADD     | OTU1    | -18 to -3 dBm     | -10.5 dBm               |
| OC-48/STM-16 THROUGH  | OTU2    | -24 to -10 dBm    | -17 dBm                 |
| OC-48/STM-16 DROP     | OTUD1   | -24 to -10 dBm    | -17 dBm                 |
| OC-192/STM-64 ADD     | OTU30   | -13 to -3 dBm     | -8 dBm                  |
| OC-192/STM-64 THROUGH | OTU31   | -20 to -13 dBm    | -16.5 dBm               |
| OC-192/STM-64 DROP    | OTUD30  | -20 to -13 dBm    | -16.5 dBm               |

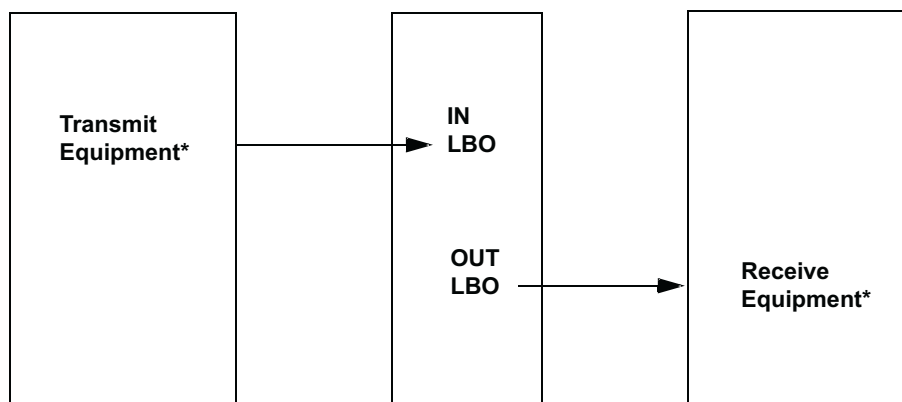


**Table 14-3 OTU Input Power Range (continued)**

| OTU TYPE                 | CP CODE | Input Power Range                                              | Recommended Input Power                                   |
|--------------------------|---------|----------------------------------------------------------------|-----------------------------------------------------------|
| HSBB ADD                 | OTU40   | -18 to -3 dBm                                                  | -10.5 dBm                                                 |
| HSBB DROP                | OTUD40  | -24 to -10 dBm                                                 | -17 dBm                                                   |
| ORS                      |         | -11dBm to 0.5 dBm<br>when ORS works with<br>OC48 and HSBB OTUs | -6 dBm to 0.5dBm<br>when ORS works with<br>OC192 FEC OTUs |
| 4:1 10G Multiplex<br>OTU | OTU70   | -15 to -4 dBm                                                  | -15 to -4 dBm                                             |

**Supporting Figure**

**Figure 14-5 Location of LBOs at OTU (One Direction)**



\*WaveStar OLS 1.6T, or other vendors add/drop multiplexers

□

## DLP-526: Inspect/Replace Dust Filter

**Overview** Use the procedure below to inspect/replace a dirty dust filter.

**Procedure**      **Important!** A dirty filter causes a substantial reduction in the amount of available cooling air to the bays.

- 1 Identify the location of the appropriate dust filter cover.
- 2 At the top corners of each cover, locate the 1/4 turn screw, which is part of the latch assembly.
- 3 Using an appropriate screwdriver, rotate the 1/4 turn screw counterclockwise 90 degrees to unlock each latch handle.
- 4 Pivot each latch handle so it is perpendicular to the front face of the cover.
- 5 Pull on the latch handles to open the cover.
- 6 Rotate the two plastic finger grips located on the filter from the horizontal to the vertical position.
- 7 Remove the dust filter by pulling on the finger grips to slide it out of the shelf.
- 8 Inspect the dust filter for excessive dirt or blockage.
- 9 Did the inspection indicate a dirty or blocked dust filter?

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 10</a> . |
| <b>NO</b>  | Continue with <a href="#">Step 11</a>   |

- 
- 10** Discard the old filter.
- 

**Important!** Replace **ALL** dust filters in the bay that have a **Clogged Dust Filter 1 or 2** (or both) condition.

- 11** Install a new or reinsert the old filter with the air flow arrows (located on the filter's edge) pointing up by first rotating the two plastic finger grips to the vertical position and sliding it into the same location on the shelf.
- 
- 12** Close the cover, rotate the latch handles clockwise approximately 90 degrees and then pivot the handles so they are flush with the front face of the cover.
- 
- 13** Using an appropriate screwdriver, rotate the 1/4 turn screw clockwise 90 degrees to lock the latch handle.

END OF STEPS

---



## DLP-527: Replace Fan Assembly

---

**Overview** Use the procedure below to replace a defective fan assembly.

**Procedure**      **Important!** Individual defective fans are not to be replaced. The entire fan assembly is to be replaced and returned for repair.

---

**1** Identify the location of the defective fan assembly by the lighted Fault LED located at the front of the fan assembly.

---

**2** Using a flat bladed screwdriver loosen the two 1/4 turn fasteners that secure the fan assembly in place by turning them in a counter clockwise direction.

---

**3** Change the position of the wire spring pulls from flush against the face of the fan assembly to a horizontal position.

---

**Important!** The wire spring pulls are attached to the 1/4 turn fasteners

**4** Pull on the wire spring pulls to remove the fan assembly from the fan shelf.

---

**5** Slide the replacement fan assembly into this shelf until the front is flush with the bayshelf framework.

---

**6** Using a flat bladed screwdriver tighten the two 1/4 turn fasteners that secure the fan assembly in place by turning them in a clockwise direction.

---

**7** Change the position of the wire spring pulls so they are flush against the face of the fan assembly.

END OF STEPS

---



## DLP-528: LBO Application

**Overview** This procedure is used to determine the correct value of Line Build Out (LBO) required for the certain ports when installing an optical amplifier (OA) or optical translator unit (OTU).

Required Test Equipment:

- Wrist Strap
- Optical Power Meter
- Multiwavelength Meter or low polarization Optical Spectrum Analyzer (OSA)

**Important!** Multiwavelength Meter or low polarization Optical Spectrum Analyzer required for use only on systems that require pre-equalization.

### Procedure

- 1 Are you installing or equipping an OA, OTU or OMU?

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>OA</b>  | Continue with <a href="#">Step 2</a> .  |
| <b>OTU</b> | Continue with <a href="#">Step 12</a> . |
| <b>OMU</b> | Continue with <a href="#">Step 37</a>   |

**Important!** In this procedure, the circuit pack that first indicated "failed" or that you were instructed to change is called the **original**.

- 2 On the **original** OA remove any LBO from the OUT port.
- 3 Clean the LBO removed from [Step 2](#) and the OUT port of the **replacement** OA. For details, go to ["DLP-510: Inspect and Clean Optical Fiber Connectors" \(14-12\)](#).
- 4 Install the LBO into the OUT port of the **replacement** OA. For details see ["DLP-512: Install/Remove Lightguide Buildout" \(14-24\)](#).

- .....
- 5** On the **original** OA remove any LBO from the **DCM OUT** port.
- .....
- 6** Clean the LBO removed from the DCM OUT port of the **replacement** OA. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 7** Install the LBO removed from the DCM OUT port of the **original** OA in the DCM OUT port of the **replacement** OA. For details, go to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....
- 8** On the **original** OA remove any LBO from the IN port.
- .....
- 9** Clean the LBO removed from [Step 8](#) and the IN port of the **replacement** OA. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 10** Install the LBO into the IN port of the **replacement** OA. For details see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....
- 11** **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**
- .....
- 12** From the local engineering records determine if Pre-equalization is required.

| IF...                                                                               | THEN...                                                                                    |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Pre-equalization is required                                                        | Continue with Step 1 of the section, <a href="#">“Pre-Equalization Required” (14-67)</a> . |
| Pre-equalization is not required or required on four specific optical channels only | Continue with <a href="#">Step 13</a> .                                                    |

- .....
- 13** What type of OTU is being added or replaced in the system?

| IF...                                                    | THEN...                                 |
|----------------------------------------------------------|-----------------------------------------|
| <b>OC-48/STM16,<br/>OC-192/STM64, 10Gb/s or<br/>HSBB</b> | Continue with <a href="#">Step 14</a> . |
| <b>LSBB,</b>                                             | Continue with <a href="#">Step 16</a> . |

- .....
- 14** Connect the power meter to the OTU OUT() port of the OTU being installed.
- .....

- 15** Is the OTU optical power output -4.3 to -6.0 dBm?

| IF...      | THEN...                                             |
|------------|-----------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 18</a> .             |
| <b>NO</b>  | Replace OTU and return to <a href="#">Step 14</a> . |

- .....
- 16** Connect the power meter to the OTU OUT port of the OTU being installed.
- .....

- 17** Is the OTU optical power output -4.0 to -6.0 dBm?

| IF...      | THEN...                                             |
|------------|-----------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 18</a> .             |
| <b>NO</b>  | Replace OTU and return to <a href="#">Step 16</a> . |

- .....
- 18** Did you replace an OTU with a channel frequency of 9190, 9210 or 9360, 9380?

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 19</a> . |
| <b>NO</b>  | Continue with <a href="#">Step 22</a> . |

- .....
- 19** On the original OTU remove any LBO from the OUT () ports. For details, go to [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).

- .....
- 20** Clean the LBO's removed in [Step 19](#). For details go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#)
- .....
- 21** Install the LBO's cleaned in [Step 20](#) into the out port(s) of the replacement OTU.
- .....
- 22** Clean the OTU () Out and OMU () IN port and both ends of the fiber jumper that will be used to make the connection. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 23** Connect the fiber jumper between OTU () OUT port(s) and OMU () IN port(s).
- .....
- 24** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***
- .....
- 25** Connect the power meter to the OTU OUT() port of the OTU being installed.
- .....
- 26** Is the OTU optical power output -4.3 dBm to -6.0 dBm?
- | IF...      | THEN...                                             |
|------------|-----------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 27</a> .             |
| <b>NO</b>  | Replace OTU and return to <a href="#">Step 25</a> . |
- .....
- 27** Connect a Multiwavemeter or OSA to the OUT2 port of OMU1.
- .....
- 28** Clean the OTU () OUT and OMU () IN port and both ends of the fiber jumper that will be used to make the connection. For details, go to [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 29** Connect a fiber jumper between the OTU () OUT port and OMU() IN port.



- .....
- 30** At the Multiwavelength Meter or OSA, measure the power level of the channel being added.
- .....
- 31** Compute the required LBO for the channel being added. The target level for the channel being added is -19.0 dBm $\pm$ 0.5 dB.
- .....
- 32** Select and clean LBO determined from computations in [Step 31](#). For details see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....
- 33** If required, install the correct LBO (determined in [Step 31](#)) at the OUT() port of the OTU() of the channel being added. For details, see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....
- 34** At the Multiwavelength Meter or OSA, observe the channel power levels. Added channel power level should be -19.0 dBm $\pm$  0.5dB.

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 35</a> . |
| <b>NO</b>  | Return to <a href="#">Step 30</a> .     |

- .....
- 35** Disconnect the Multiwavelength Meter or OSA from the OMU() OUT2 port.
- .....

- 36** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***
- .....

- 37** From the local engineering records determine if Pre-equalization is required.

| IF...                            | THEN...                                                |
|----------------------------------|--------------------------------------------------------|
| Pre-equalization is not required | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |

| IF...                                                               | THEN...                                                                                                                                                           |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pre-equalization is required on four specific optical channels only | Continue with Step 1 of the section, <a href="#">“Identify the Bay, Shelf and Slot of the OTUs with Channel Frequencies of 9190,9210 and 9360,9380” (14-64)</a> . |
| Pre-equalization is required                                        | Continue with Step 1 of the section, <a href="#">“Pre-Equalization Required” (14-67)</a> .                                                                        |

END OF STEPS

### Identify the Bay, Shelf and Slot of the OTUs with Channel Frequencies of 9190,9210 and 9360,9380

- 1 At the CIT, click **REPORT>Port Associations List**
- 2 Click on **WaveStar OLS 1.6T**. AID = System
- 3 Click on the **Select** button.
- 4 Scan the SOURCE PORT AID column and find 9190,9210 and 9360,9380 optical channel frequencies.
- 5 Record the Bay, Shelf and Slot for the two OTU's identified in [Step 4](#) of this section, [“Identify the Bay, Shelf and Slot of the OTUs with Channel Frequencies of 9190,9210 and 9360,9380” \(14-64\)](#).
- 6 Remove the appropriate shelf cover(s).

END OF STEPS

**Calculate New LBO values for OTU OUT() ports**  
.....

- 1** Remove the LBO that is installed in the OTU OUT() port for channel frequencies 9190, 9210, 9360, 9380.  
.....
- 2** Using an optical power meter, measure and record the output power corresponding to channel frequencies 9190, 9210 and 9360, 9380.  
.....
- 3** Record the OMU loss for each of the frequencies 9190, 9210 and 9360, 9380. OMU loss for these frequencies is recorded on the faceplate of the new OMU installed.  
.....
- 4** Using [Table 14-4, “Target Level for OMU OUTPUT 2” \(14-66\)](#) determine the required Target Power for the two OTU’s identified in [Step 4](#) of the section [“Identify the Bay, Shelf and Slot of the OTUs with Channel Frequencies of 9190,9210 and 9360,9380” \(14-64\)](#).  
.....
- 5** Using data collected in [Step 2](#), [Step 3](#), and [Step 4](#) of this section [“Calculate New LBO values for OTU OUT\(\) ports” \(14-65\)](#), calculate the required new LBO values for each optical channel using the formula: New LBO = OTU output power - (New OMU loss) - Target Power  
New LBO [9120] = [Record new value]  
New LBO [9210] = [Record new value]  
New LBO [9360] = [Record new value]  
New LBO [9380] = [Record new value]

END OF STEPS  
.....

**Table 14-4 Target Level for OMU OUTPUT 2**

| Number of Channels | Type of System Inputs | OTU under Test | Target Level     |
|--------------------|-----------------------|----------------|------------------|
| 80                 | Only OC-48            | OC-48          | -19.0 dBm +/-0.5 |
| 80                 | Only OC-192           | OC-192         | -19.0 dBm +/-0.5 |
| 80                 | Mixed OC-48 & OC192   | OC-48          | -19.0 dBm +/-0.5 |
|                    |                       | OC-192         | -19.0 dBm +/-0.5 |

### Install New LBO Values

- 1 Select and clean LBO determined from computations in [Step 5](#) of [“Calculate New LBO values for OTU OUT\(\) ports” \(14-65\)](#). For details see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
  - 2 Clean the OTU OUT () port for channel frequencies 9190, 9210 and 9360, 9380.
  - 3 Install the correct LBO (determined in [Step 5](#)) of [“Calculate New LBO values for OTU OUT\(\) ports” \(14-65\)](#) at the OUT() port of the OTUs for channel frequencies 9190, 9210 and 9360, 9380. For details, see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
  - 4 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**
- END OF STEPS

**Pre-Equalization Required**

- 1 Select an add OTU and connect the power meter to OTU OUT() port.

- 2 Is the OTU optical power output - 4.3 to -6.0 dBm?

| IF...      | THEN...                                            |
|------------|----------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 3</a> .             |
| <b>NO</b>  | Replace OTU and return to <a href="#">Step 2</a> . |

- 3 Reconnect the fiber jumper between the OTU () OUT port and OMU() IN port.
- 4 Connect a Multiwavemeter or OSA to the OUT2 port of OMU1.
- 5 At the Multiwavelength Meter or OSA observe the power level of the selected channel. Using [Table 14-4, “Target Level for OMU OUTPUT 2” \(14-66\)](#) determine the correct power level for the selected channel.
- 6 If the power level does **not** fall within the target level, compute the required LBO that will bring the power level into the target range.
- 7 Select and clean LBO determined from computations in [Step 6](#). For details see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- 8 If required, install the correct LBO (determined in [Step 6](#)) at the OUT() port of the OTU() of the selected channel. For details, see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- 9 At the Multiwavelength Meter or OSA, observe the selected channel power level. Power level should be within +/- 0.5 dB of target level list in [Table 14-4, “Target Level for OMU OUTPUT 2” \(14-66\)](#).

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 10</a> . |
| <b>NO</b>  | Return to <a href="#">Step 6</a> .      |

- .....
- 10** At the Multiwavelength Meter or OSA compare the power level of all the remaining optical channels on the system to the optical channel selected in [Step 1](#).
- .....

- 11** If required, compute the required LBO for any optical channel not within +/- 0.5 dB of the optical channel selected in [Step 1](#).
- .....

- 12** Select and clean LBO determined from computations in [Step 11](#). For details see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 13** If required, install the LBO (determined in [Step 11](#)) at the OUT port of the OTU() of any add optical channel that is not within +/- 0.5 dB of the optical channel selected in [Step 1](#). For details, see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....

- 14** At the Multiwavelength Meter or OSA, observe the optical channel output levels. Are all channels should be within +/- 0.5 dB of the channel selected in [Step 1](#)

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 15</a> . |
| <b>NO</b>  | Return to <a href="#">Step 11</a> .     |

- .....
- 15** Disconnect the Multiwavelength Meter or OSA from the OMU1 (OUT2) port.
- .....

- 16** ***STOP! YOU HAVE COMPLETED THIS PROCEDURE.***

- .....
- 17** Is the system equipped with OC48/STM16 add OTU's

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 18</a>   |
| <b>NO</b>  | Continue with <a href="#">Step 32</a> . |

.....

- 18** Select and add OC48/STM16 OTU and connect the power meter to OTU OUT() port.
- .....

- 19** Is the OTU optical power output -4.3 dBm to -6.0?

| IF...      | THEN...                                          |
|------------|--------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 20</a> .          |
| <b>NO</b>  | Replace OTU and repeat <a href="#">Step 19</a> . |

.....

- 20** Reconnect the fiber jumper between the OTU () OUT port and OMU() IN port.
- .....

- 21** Connect a Multiwavemeter or OSA to the OUT2 port of OMU1.
- .....

- 22** At the Multiwavelength Meter or OSA observe the power level of the selected channel. The target level for the selected OC48/STM16 optical channel is -19.0 dBm +/-0.5 dB.
- .....

- 23** If the power level does **not** fall within the target level, compute the required LBO that will bring the power level into the target range.
- .....

- 24** If required select and clean LBO determined from computations in [Step 23](#). For details see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- .....
- 25** If required, install the correct LBO (determined in [Step 23](#)) at the OUT() port of the OTU() of the selected channel. For details, see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....

- 26** At the Multiwavelength Meter or OSA, observe the selected channel power level. The power level should be within -19.0 dBm +/-0.5 dB target level.

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 27</a> . |
| <b>NO</b>  | Return to <a href="#">Step 23</a> .     |

.....

- 27** At the Multiwavelength Meter or OSA compare the power level of all the remaining add OC48/STM16 optical channels on the system to the optical channel selected in [Step 18](#).
- .....

- 28** If required, compute the required LBO for any optical channel not within +/- 0.5 dB of the optical channel selected in [Step 18](#).
- .....

- 29** Select and clean LBO determined from computations in [Step 28](#). For details see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 30** If required, install the LBO (determined in [Step 28](#)) at the OUT port of the OTU() of any add optical channel that is not within +/- 0.5 dB of the optical channel selected in [Step 18](#). For details, see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....

- 31** At the Multiwavelength Meter or OSA, observe the optical channel output levels. Are all OC48/STM16 channels should be within +/- 0.5 dB of the channel selected in [Step 18](#).

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 32</a> . |



| IF...     | THEN...                           |
|-----------|-----------------------------------|
| <b>NO</b> | Return to <a href="#">Step 28</a> |

- .....
- 32** Is the system equipped with add OC-192/STM 64 OTU's?

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>NO</b>  | STOP YOU HAVE COMPLETED THIS PROCEDURE  |
| <b>YES</b> | Continue with <a href="#">Step 33</a> . |

- .....
- 33** Select and add OC-192/STM 64 OTU and connect the power meter to OTU OUT() port.

- .....
- 34** Is the OTU optical power output -4.3 dBm to -6.0 dBm?

| IF...      | THEN...                                            |
|------------|----------------------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 35</a> .            |
| <b>NO</b>  | Replace the OTU and repeat <a href="#">Step 34</a> |

- .....
- 35** Reconnect the fiber jumper between the OTU () OUT port and OMU() IN port.

- .....
- 36** Connect a Multiwavemeter or OSA to the OUT2 port of OMU1.

- .....
- 37** At the Multiwavelength Meter or OSA observe the power level of the selected channel. The target level for the selected OC192/STM 64 optical channel is -19.0 dBm +/-0.5 dB.

- .....
- 38** If the power level does **not** fall within the target level, compute the required LBO that will bring the power level into the target range.

- .....
- 39** If required select and clean LBO determined from computations in [Step 38](#). For details see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).

- .....
- 40** If required, install the correct LBO (determined in [Step 38](#)) at the OUT() port of the OTU() of the selected channel. For details, see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#).
- .....

- 41** At the Multiwavelength Meter or OSA, observe the selected channel power level. Power level should be within -19.0 dBm +/-0.5 dB target level.

| IF...      | THEN...                                 |
|------------|-----------------------------------------|
| <b>YES</b> | Continue with <a href="#">Step 42</a> . |
| <b>NO</b>  | Return to <a href="#">Step 38</a> .     |

.....

- 42** At the Multiwavelength Meter or OSA compare the power level of all the remaining add OC192/STM 64 optical channels on the system to the optical channel selected in [Step 33](#).
- .....

- 43** If required, compute the required LBO for any optical channel not within +/- 0.5 dB of the optical channel selected in [Step 33](#).
- .....

- 44** Select and clean LBO determined from computations in [Step 43](#). For details see [“DLP-510: Inspect and Clean Optical Fiber Connectors” \(14-12\)](#).
- .....

- 45** If required, install the LBO (determined in [Step 43](#)) at the OUT port of the OTU() of any add optical channel that is not within +/- 0.5 dB of the optical channel selected in [Step 33](#). For details, see [“DLP-512: Install/Remove Lightguide Buildout” \(14-24\)](#)
- .....

- 46** At the Multiwavelength Meter or OSA, observe the optical channel output levels. Are all OC-192/STM 64 channels should be within +/- 0.5 dB of the channel selected in [Step 33](#).

| IF...      | THEN...                                                |
|------------|--------------------------------------------------------|
| <b>YES</b> | <b><i>STOP! YOU HAVE COMPLETED THIS PROCEDURE.</i></b> |
| <b>NO</b>  | Return to <a href="#">Step 43</a> .                    |

END OF STEPS



# DLP-529: Baseline Optical Parameters

---

**Overview** This procedure establishes baseline optical parameters for replaced circuit packs, repaired fiber, and added or deleted optical channels to the system.

**Procedure** **Important!** All commands can be entered from any network element by logging into the desired remote network element. For details, go to [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).

---

- 1 Which Baseline Optical Parameter function is to be performed?

| IF...                                          | THEN...                                                             |
|------------------------------------------------|---------------------------------------------------------------------|
| SUPVY circuit pack replacement                 | Go to <a href="#">“Baseline SUPVY ” (14-75)</a> .                   |
| OA circuit pack replacement                    | Go to <a href="#">“Baseline OA” (14-76)</a> .                       |
| OMON circuit pack replacement                  | Go to <a href="#">“Baseline OMON” (14-78)</a> .                     |
| Outside Plant Fiber repair                     | Go to <a href="#">“Baseline Outside Plant Fiber ” (14-79)</a> .     |
| If adding an Optical Channel to the system     | Go to <a href="#">“Baseline Added Optical Channel” (14-80)</a> .    |
| If deleting an Optical Channel from the system | Go to <a href="#">“Baseline Deleted Optical Channel ” (14-83)</a> . |

END OF STEPS

---

**Baseline SUPVY**

---

- 1** When a SUPVY circuit pack is replaced, use the CIT at that network element to select **PERFORMANCE-Manual Baseline**.  

---
- 2** In the dialog box that appears, use the mouse to select the appropriate Bay, Shelf, SUPVY circuit pack and line-1(e/w) Then, click **SELECT**.  

---
- 3** In the Set Baseline Supervisory dialog box, select the reason for baseline. Select the same reason for both supervisory channel directions (SPR-SU and SPT-SU).  

---
- 4** Click on the radio button under Apply To for This Supervisory Channel Only.  

---
- 5** Click on the **OK** button.  

---
- 6** For a Ring Node or repeater(s), repeat [Step 1](#) through [Step 5](#) for the other line-1e or 1w.  

---
- 7** Initiate a login session at the next upstream network element. For details, see [“DLP-518: Initiate or Terminate Login Session to a Network Element Using WaveStar® OLS 1.6T CIT” \(14-43\)](#).  

---
- 8** At the CIT, select **PERFORMANCE-Manual Baseline**.  

---
- 9** In the dialog box that appears, use the mouse to select the appropriate bay, shelf, SUPVY circuit pack and line-1(e/w). Select the line-1(e/w) that is receiving from the node where the SUPVY circuit pack was replaced. Then click **SELECT**.  

---
- 10** In the Set Baseline Supervisory dialog box, select the reason for baselining. Select the reason for only receive supervisory channel direction (SPR-SU).

.....

**11** Click on the radio button under Apply to This Supervisory Channel Only.

.....

**12** Click on the **OK** button.

.....

**13** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS

.....

### **Baseline OA**

.....

**1** When an OA circuit pack is replaced, use the CIT at that network element to select **PERFORMANCE-Manual Baseline**.

.....

**2** In the dialog box that appears, using the mouse, select the appropriate Bay, Shelf, OA circuit pack and line-1(e/w). Select the circuit pack that was replaced. Then click **SELECT**.

.....

**3** In the Set Baseline Optical Line dialog box, select the reason to baseline.

.....

**4** Click on the radio button under Apply to this Optical Line Only.

.....

**5** Click on the **OK** button.

.....

**6** At the CIT, select **PERFORMANCE-Manual Baseline**.

.....

**7** In the dialog box that appears, use the mouse to select the appropriate Bay, Shelf, OTU() circuit pack and channel parameters, for example, Optical Channel-ochan-1e-9360. Select an OTU that is associated with the OA circuit pack that was replaced. Then click **SELECT**.

- .....  
**8** In the Set Baseline Optical Channel dialog box, select the reason to baseline.  
.....
- 9** Click on the radio button under Apply To all Optical Channels.  
.....
- 10** Click on the **OK** button.  
.....
- 11** At the CIT, select **PERFORMANCE-Manual Baseline**.  
.....
- 12** In the dialog box that appears, use the mouse to select the appropriate Bay, Shelf, SUPVY circuit pack and line-1(e/w). Select the SUPVY circuit pack associated with the OA circuit pack that was replaced. Then click **SELECT**.  
.....
- 13** In the Set Baseline Supervisory dialog box, select the reason to baseline. Select the same reason for both supervisory channel directions (SPR-SU or SPT-SU).  
.....
- 14** Click on the radio button under Apply To for This Supervisory Channel Only.  
.....
- 15** Click on the **OK** button.  
.....
- 16** Repeat [Step 1](#) through [Step 15](#) for the other Line-1e or 1w.  
.....
- 17** STOP! YOU HAVE COMPLETED THIS PROCEDURE.  
E N D O F S T E P S  
.....

**Baseline OMON**

---

**Important!** When an OMON circuit pack is replaced, part of this procedure must be repeated for all optical channels present at the node since the OMON is shared across all optical channels.

- 1 When an OMON circuit pack is replaced, use the CIT at that network element to select **PERFORMANCE-Manual Baseline**.
- 

**Important!** An OTU is selected and not the OMON circuit pack.

- 2 In the dialog box that appears, use the mouse to select the appropriate Bay, Shelf, OTU() circuit pack and channel parameters, for example, Optical Channel-ochan-1e-9200. Select an OTU that is associated with an OA circuit pack that is connected to the OMON circuit pack that was replaced. Then click **SELECT**.
- 

- 3 In the Set Baseline Optical Channel dialog box, select the reason to baseline. Select the reason for Signal Power, Received (SPR-C) and Transmitted (SPT-C).
- 

- 4 Click on the radio button under Apply To for All Optical Channels.
- 

- 5 Click on the **OK** button.
- 

- 6 Repeat [Step 2](#) through [Step 5](#) for any additional optical line(s) connected to the OMON circuit pack at this network element.
- 

- 7 **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

END OF STEPS

---



**Baseline Outside Plant Fiber**  
.....

- 1** At the CIT, initiate a login session to the site immediately downstream from the optical fiber repair.  
.....
- 2** At the CIT, select **PERFORMANCE-Manual Baseline**.  
.....
- 3** In the dialog box that appears, use the mouse to select the appropriate Bay, Shelf, OA circuit pack and line-1(e/w). Select the OA circuit pack associated with the optical fiber that was repaired. Then click **SELECT**.  
.....
- 4** In the Set Baseline Optical Line dialog box, select the reason to baseline. Select a reason for both total optical power, Received (TOPR-OL) and Transmitted (TOPT-OL).  
.....
- 5** Click on the radio button under Apply To for This Optical Line Only.  
.....
- 6** Click on the **OK** button.  
.....
- 7** **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

**END OF STEPS**  
.....

## Baseline Added Optical Channel

- 1 How many optical channels are now equipped or in-service on the system?

| IF...               | THEN...                                |
|---------------------|----------------------------------------|
| Eight (8) or more   | Continue with <a href="#">Step 2</a> . |
| Less than eight (8) | Continue with <a href="#">Step 3</a> . |

- 2 Eight (8) or More Channels
  1. At the East terminal and at the CIT, select **PERFORMANCE-Manual Baseline**.
  2. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OA circuit pack and line-1(e/w). Then click **SELECT**.
  3. In the Set Baseline Optical Line dialog box, select the reason for baseline.
  4. Click on the radio button under Apply To for This Optical Line Only.
  5. Click on the **OK** button.
  6. At the CIT, select **PERFORMANCE-Manual Baseline**.
  7. In the dialog box that appears, use the mouse to select the appropriate Bay, Shelf, OTU circuit pack and channel parameters, for example, Optical Channel-ochan-1e-9380 (new ochan #####). Select the OTU that is associated with the Optical Channel being added. Then click **SELECT**.
  8. In the Set Baseline Optical Channel dialog box, select the reason to baseline, for example, CHAN\_ADDED.
  9. Click on the radio button under Apply To for This Optical Channel Only.
  10. Click on the **OK** button and click **OK** again to execute.
  11. At the West terminal and at the CIT, select **PERFORMANCE-Manual Baseline**.
  12. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OA circuit pack and line-1(w/e). Then click **SELECT**.

13. In the Set Baseline Optical Line dialog box, select the reason to baseline. Select a reason for both total optical power [Received (TOPR-OL) and Transmitted (TOPT-OL)].
  14. Click on the radio button under Apply To for This Optical Line Only.
  15. Click on the **OK** button.
  16. At the CIT, select **PERFORMANCE-Manual Baseline**.
  17. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OTU circuit pack and channel parameters, for example, Optical Channel-ochan-1e-9380 (new ochan #####). Select the OTU that is associated with the Optical Channel being added and click **SELECT**.
  18. In the Set Baseline Optical Channel dialog box, select the reason to baseline. Select a reason for Signal Power, Received (SPR-C) and Transmitted (SPT-C).
  19. Click on the radio button under Apply To for This Optical Channel Only.
  20. Click on the **OK** button.
  21. ***STOP! YOU HAVE COMPELETED THIS PROCEDURE.***
- .....

### **3** Less Than Eight (8) Channels

1. At the East terminal and at the CIT, select **PERFORMANCE-Manual Baseline**.
2. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OA circuit pack and line-1(e/w). Then click **SELECT**.
3. In the Set Baseline Optical Line dialog box, select a reason to baseline.
4. Click on the radio button under Apply To for This Optical Line Only.
5. Click on the **OK** button.
6. At the CIT, select **PERFORMANCE-Baseline**.

7. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OTU circuit pack and channel parameters, for example, Optical Channel-ochan-1e-9380 (new ochan #####). Select the OTU that is associated with the Optical Channel being added. Then click **SELECT**.
8. In the Set Baseline Optical Channel dialog box, select a reason to baseline.
9. Click on the radio button under Apply To for All Optical Channels.
10. Click on the **OK** button.
11. At the West terminal and at the CIT, select **PERFORMANCE-Manual Baseline**.
12. In the dialog box that appears, use the mouse to select the appropriate Bay, Shelf, OA circuit pack and line-1(w/e). Then click **SELECT**.
13. In the Set Baseline Optical Line dialog box, select a reason to baseline.
14. Click on the radio button under Apply To for This Optical Line Only.
15. Click on the **OK** button.
16. At the CIT, select **PERFORMANCE-Manual Baseline**.
17. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OTU circuit pack and channel parameters, for example, Optical Channel-ochan-1e-9380 (new ochan #####). Select the OTU that is associated with the Optical Channel being added. Then click **SELECT**.
18. In the Set Baseline Optical Channel dialog box, select a reason to baseline.
19. Click on the radio button under Apply To for All Optical Channels.
20. Click on the **OK** button.
21. STOP! YOU HAVE COMPLETED THIS PROCEDURE

END OF STEPS

**Baseline Deleted Optical Channel**  
.....

- 1** How many optical channels are now equipped or in-service on the system?

| IF...         | THEN...                               |
|---------------|---------------------------------------|
| Nine or more  | Continue with <a href="#">Step 2.</a> |
| Eight or less | Continue with <a href="#">Step 3.</a> |

  
.....

**2** Nine (9) or More Channels

1. At the East terminal and at the CIT, select **PERFORMANCE-Manual Baseline**.
2. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OA circuit pack and line-1(e/w). Then click **SELECT**.
3. In the Set Baseline Optical Line dialog box, select a reason to baseline.
4. Click on the radio button under Apply To for This Optical Line Only.
5. Click on the **OK** button.
6. At the West terminal and at the CIT, select **PERFORMANCE-Manual Baseline**.
7. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OA circuit pack and line-1(e/w). Then click **SELECT**.
8. In the Set Baseline Optical Line dialog box, select a reason to baseline.
9. Click on the radio button under Apply To for This Optical Line Only.
10. Click on the **OK** button.
11. **STOP! YOU HAVE COMPELETED THIS PROCEDURE.**

---

### 3 Eight or less Channels

1. At the East terminal and at the CIT, select **PERFORMANCE-Manual Baseline**.
2. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OA circuit pack and line-1(e/w). Then click **SELECT**.
3. In the Set Baseline Optical Line dialog box, select a reason to baseline. Select a reason for both total optical power [Received (TOPR-OL) and Transmitted (TOPT-OL)].
4. Click on the radio button under Apply To for This Optical Line Only.
5. Click on the **OK** button.
6. At the CIT, select **PERFORMANCE-Manual Baseline**.
7. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OTU circuit pack and channel parameters, for example, Optical Channel-ochan-1e-9380 (new ochan #####). Select the OTU that is associated with the Optical Channel being deleted. Then click **SELECT**.
8. In the Set Baseline Optical Channel dialog box, select the reason to baseline. Select the reason for Signal Power, Received (TOPR-OCHAN) and Transmitted (TOPT-OCHAN).
9. Click on the radio button under Apply To for All Optical Channels.
10. Click on the **OK** button.
11. At the West terminal and at the CIT, select, **PERFORMANCE-Manual Baseline**.
12. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OA circuit pack and line-1(e/w). Then click **SELECT**.
13. In the Set Baseline Optical Line dialog box, select the reason to baseline. Select the reason for both total optical power [Received (TOPR-OL) and Transmitted (TOPT-OL)].
14. Click on the radio button under Apply To for This Optical Line Only.
15. Click on the **OK** button.
16. At the CIT, select **PERFORMANCE-Manual Baseline**.

17. In the dialog box that appears, use the mouse and select the appropriate Bay, Shelf, OTU circuit pack and channel parameters, for example, Optical Channel-ochan-1e-9380 (new ochan #####). Select the OTU that is associated with the Optical Channel being deleted and click **SELECT**.
18. In the Set Baseline Optical Channel dialog box, select the reason to baseline. Select reason for Signal Power, Received (TOPR-OCHAN) and Transmitted (TOPT-OCHAN).
19. Click on the radio button under Apply To for All Optical Channels.
20. Click on the **OK** button.
21. ***STOP! YOU HAVE COMPELETED THIS PROCEDURE.***

END OF STEPS

---



## DLP-530: DCM LBO Procedure

---

**Overview** Use the following procedure to choose the LBO for the DCM port of an OA.

### Procedure



### CAUTION

*SERVICE AFFECTING - The following steps will cause traffic interruption.*

---

- 1 Is there a DCM associated with this OA?

| IF... | THEN...               |
|-------|-----------------------|
| YES   | Continue with Step 6. |
| NO    | Continue with Step 2. |

---

- 2 Remove the fiber jumpers from the DCM IN and DCM OUT ports of the OA.
- 

- 3 Put a 9 dB LBO on the DCM OUT Port of the OA.
- 

- 4 Clean and reconnect the appropriate fiber to the respective DCM IN and DCM OUT Port of the OA.
- 

- 5 STOP! YOU HAVE COMPLETED THIS PROCEDURE.
- 

- 6 Remove the fiber jumpers from the DCM IN and DCM OUT ports of the OA.
- 

- 7 Remove the fiber from the Out Port of the Supervisory pack.



- .....
- 8** Using a clean fiber, measure and record the optical power (P) at the OUT port of the Supervisory pack.
- .....
- 9** Clean and attach the fiber from the In port of the DCM to the OUT port of the Supervisory pack.
- .....
- 10** Clean the fiber from the Out port of the DCM and measure and record (R) the power out of the DCM.
- .....
- 11** Determine the DCM Loss  $DCM\_LOSS = P - R$
- .....
- 12** Determine the size of the DCM LBO required and install the LBO in the DCM OUT port of the OA.  $DCM\_LBO = 9\text{ dB} - DCM\_LOSS$  (use 0 dB LBO if  $DCM\_LOSS > 9\text{ dB}$ )
- .....
- 13** Clean and reconnect the fiber disconnected in Step 7 to the Out Port of the Supervisory Pack.
- .....
- 14** Clean and reconnect the fibers disconnected in Step 6 to the respective DCM IN and DCM OUT port of the OA.

.....

END OF STEPS

.....



# DLP-531: Packaging of Lucent Technologies Bays, Subrack Assemblies, and Individual Circuit Packs for Return

---

**Overview** Use the following procedure for the handling and packaging of bays (cabinets), subrack assemblies, and individual circuit packs for transport both within the office and to off-site locations.

## Procedure



### CAUTION

*Improper packing of equipment may cause irreparable damage to the unit. Follow these instructions carefully to insure safe shipping and handling. In all cases, care must be used when handling these products. Do not stack circuit packs directly on top of each other, otherwise damage to components may occur. Exposed fiber connections on the circuit pack should be plugged. Fiber optic cables should not be bent and exposed ends should be covered. Proper ESD procedures must be used at all times. Ensure that all plastic bags, wraps, and cushioning materials, used for packaging purposes, are ESD safe.*

---

- 1 Are you transporting/handling a bay, subrack assembly, or circuit pack within the office?

| IF...            | THEN...                |
|------------------|------------------------|
| BAY              | Continue with Step 2.  |
| SUBRACK ASSEMBLY | Continue with Step 6.  |
| CIRCUIT PACK     | Continue with Step 10. |

---



### WARNING

*Improper packing of a circuit pack violates the warranty conditions of the product.*

- 2 Bays can be moved within an office fully equipped. Ensure that all circuit packs are fully seated and properly latched. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#). Ensure all subrack assemblies are secured with all screws in place and tightened. Also secure any loose or dangling cable ends to prevent damage to the backplane pins.  
.....
- 3 Latch the front and rear door panels of the bay. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).  
.....
- 4 Move the bay to the desired location using installer wheels or a similar bay handling device. Proceed slowly over any irregularities in floor surfaces such as building expansion joints and elevator thresholds.  
.....
- 5 STOP! YOU HAVE COMPLETED THIS PROCEDURE.  
.....
- 6 Subrack assemblies can be transported within an office with or without circuit packs in place. If the subrack assembly is equipped with circuit packs, make sure that the latches are fully engaged. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).  
.....
- 7 Attach the front cover to the subrack assembly in order to protect the latches and other exposed components. For details, go to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#). Cover back of subrack assembly with corrugated fiberboard with flaps folded around all four sides of the units to protect the backplane pins.  
.....
- 8 Place unit in a tote box or on a cart such that the pins cannot be damaged. Place cushioning material under the unit to dampen shock and vibration when transporting on cart.  
.....
- 9 STOP! YOU HAVE COMPLETED THIS PROCEDURE

- .....
- 10** Remove circuit pack and immediately insert into a suitable ESD safe plastic bag.
- .....
- 11** Leave the existing LBOs in place on the pack so that the pack can be tested with the same conditions as when it was installed in the system.
- .....
- 12** If the circuit pack has optical connectors, place protective caps over the connectors to prevent damage and preserve cleanliness.
- .....
- Important!** Circuit packs can be transported within an office in tote boxes constructed from ESD safe materials that are equipped with slots or dividers that do not allow packs to impact against each other.
- 13** Circuit packs in ESD -safe bags may be hand-carried or placed in suitable tote boxes. Do not stack circuit packs directly on top of each other, and always use ESD safe cushioning materials between them.
- .....
- 14** STOP! YOU HAVE COMPLETED THIS PROCEDURE.
- .....
- 15** Are you transporting/handling a bay, subrack assembly, or circuit pack to another location?

| IF...            | THEN...                |
|------------------|------------------------|
| BAY              | Continue with Step 16. |
| SUBRACK ASSEMBLY | Continue with Step 21. |
| CIRCUIT PACK     | Continue with Step 26. |



## CAUTION

*When transporting Lucent Technologies equipment to off-site locations, always use adequate packaging to ensure the transportation and handling environment. All circuit packs must be removed and packed separately. Whenever possible, re-use the factory supplied packaging material, and re-package in the same manner. It is assumed that transportation will be in enclosed vehicles, that exposure to adverse weather conditions will be limited, and that all packaging must conform to local carrier regulations.*

- 16 Mount bay on a cushioned skid fully enclosed in an ESD bag.
- 17 Remove all circuit packs. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 18 Reattach the front covers to the bay. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).
- 19 Cover with a corrugated shroud or cleated plywood crate with adequate blocking. Follow all packaging instructions when assembling the containers.
- 20 STOP! YOU HAVE COMPLETED THIS PROCEDURE.
- 21 Before packaging a subrack assembly, remove the circuit packs. For details, refer to [“DLP-514: Remove and/or Install Circuit Pack” \(14-28\)](#).
- 22 Re-attach the front cover. For details, refer to [“DLP-511: Install/Remove Shelf Cover” \(14-20\)](#).

- 
- 23** Cover back of subrack assembly with corrugated fiberboard with flaps folded around all four sides of the units to protect the backplane pins. Wrap unit(s) in suitable anti-static cushioning material such as bubble or flexible foam sheets to a two-inch minimum thickness.
- 

- 24** Center the wrapped unit in a suitably sized carton constructed of double wall corrugated fiberboard. Fill any voids with additional cushioning as necessary to immobilize the unit within the container.
- 

- 25** STOP! YOU HAVE COMPLETED THIS PROCEDURE.
- 



## **WARNING**

*Improper packing of a circuit pack violates the warranty conditions of the product.*

**Important!** Always package circuit packs individually when transporting to a different location.

- 26** Place the circuit pack in ESD safe bag.

**Important!** When shipping multiple circuit packs to a single destination it is recommended to combine the separate cartons into a larger shipping container for additional in-transit protection.

---

- 27** Wrap circuit pack at least one inch thick in suitable cushioning material, such as bubble or flexible foam sheets, protecting all six sides. Center the circuit pack into a suitably sized corrugated container, filling any voids with additional cushioning as necessary to immobilize the circuit pack within the container. Ensure that package does not rattle when shaken.
- 

- 28** STOP! YOU HAVE COMPLETED THIS PROCEDURE.
-

- 
- 29** Identify all containers with contents. Apply "ESD," "THIS SIDE UP," "FRAGILE," and other precautionary labels or markings as required. Obtain the waybill identifier for the shipment from the carrier used to ship the equipment. This will prove useful in tracking the progress of the equipment as it moves from the source to the destination and will allow the recipient to identify the date and time of its arrival.
- 

- 30** STOP! YOU HAVE COMPLETED THIS PROCEDURE.

END OF STEPS

---









# Appendix A: Alarm Reference Guide

## Overview

---

**Purpose** This appendix provides an index and description of the system conditions and alarms.

**Contents**

|                                       |                     |
|---------------------------------------|---------------------|
| <a href="#">Alarm Condition Table</a> | <a href="#">A-2</a> |
|---------------------------------------|---------------------|

# Alarm Condition Table

---

## Alarm Condition Table

Table A-1 provides system conditions and alarms.

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| provisioned-controlpt                                   | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Ext Ctl Pts                       | env                              |
| provisioned environ-<br>mentalpt                        | Yes                    | MN                                    | --                   | --                      | DEFERRED                            | --                   | --                      | Ext Env Pts                       | env                              |
| SUPVY drop output<br>LOS                                | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Port (OA<br>IN)                   | supvy                            |
| SUPVY add<br>input LOS                                  | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Port (OA<br>SUP TX)               | supvy                            |
| WAD drop<br>channel<br>LOS                              | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (WAD<br>DROP IN)             | oline                            |
| WAD<br>failure                                          | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (WAD)                        | pack                             |
| WAD<br>removed                                          | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (WAD)                        | slot                             |
| APSD<br>active-line                                     | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Slot (OA)                         | pack                             |
| APSD<br>active<br>-ODU                                  | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Slot (OA)                         | pack                             |
| Insufficient<br>span loss<br>(<10dB)                    | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Line                              | oline                            |
| incoming<br>optical line<br>LOS                         | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Line                              | oline                            |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| incoming<br>optical<br>channel<br>LOS                   | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Channel<br>(Optical)              | ochan                            |
| optical<br>channel<br>transmit<br>failure               | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Channel<br>(Optical)              | ochan                            |
| <i>Activate-<br/>User-<br/>cmptcode</i>                 | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Allow-<br/>Message-<br/>Eqpt-<br/>cmptcode</i>       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Cancel-<br/>User-<br/>cmptcode</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Copy-<br/>Program-<br/>cmptcode</i>                  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Delete-<br/>Association-<br/>OTPS-<br/>cmptcode</i>  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Delete-<br/>User-<br/>Security-<br/>cmptcode</i>     | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Edit-Date-<br/>cmptcode</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Enter-Association-OTPS-cmptcode</i>                  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Enter-OLPP-cmptcode</i>                              | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Enter-OSI-cmptcode</i>                               | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Enter-OTPS:port(otps)-cmptcode</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Enter-Section-Trace-cmptcode</i>                     | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Enter-SUPR:supr-cmptcode</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Enter-System-cmptcode</i>                            | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Enter-SUPVY-Timing-Src-cmptcode</i>                  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Enter-Transport-Service-Bridge-cmptcode</i>          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>     | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|-------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                             |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                             |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Inhibit-<br/>Message-<br/>Eqpt-<br/>cmptcode</i>         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Initialize-<br/>Register-<br/>All-cmptcode</i>           | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Initialize-<br/>System-<br/>cmptcode</i>                 | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Initiate-<br/>Software-<br/>Download-<br/>cmptcode</i>   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Operate-<br/>Alarm-<br/>Cutoff-All-<br/>cmptcode</i>     | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Operate-<br/>External-<br/>Control-<br/>cmptcode</i>     | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Operate-<br/>Protection-<br/>Switch-OW-<br/>cmptcode</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Operate-<br/>Trace-OTU-<br/>cmptcode</i>                 | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Operate-Trace-SUPVY-cmptcode</i>                     | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Release-External-Control-cmptcode</i>                | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Release-Protection-Switch-OW-cmptcode</i>            | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Release-Trace-OTU-cmptcode</i>                       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Release-Trace-SUPVY-cmptcode</i>                     | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Set-Attr-Alarm-cmptcode</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Set-Attr-Control: point(cont)-cmptcode</i>           | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Set-Attr-Environ-ment: point(env)-cmptcode</i>       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Set-Baseline-Oline-cmptcode</i>                      |                        | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Set-Baseline-Oeha-cmptcode</i>                       |                        | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Set-Baseline-Supr-cmptcode</i>                       |                        | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Test-Alm-cmptcode</i>                                | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Test-Auto-Local-cmptcode</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Test-LED-cmptcode</i>                                | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Update-System-cmptcode</i>                           | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| OMS<br>(ODU1)<br>LOS                                    | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Port (ODU<br>IN)                  | oline                            |
| ODU failure                                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (ODU)                        | pack                             |
| ODU removed                                             | --                     | --                                    | MJ                   | --                      | --                                  | PROMPT               | Slot (ODU)              | Slot (ODU)                        | slot                             |
| OMU failure                                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (OMU)                        | pack                             |
| OMU removed                                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (OMU)                        | slot                             |
| EI failure                                              | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (EI)                         | pack                             |
| <b><i>INITSWD:<br/>IP</i></b>                           | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | System                            | --                               |



**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>INITSWD:<br/>check fail</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>INITSWD:<br/>comm. fail</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>INITSWD:<br/>completed</i>                           | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>INITSWD:<br/>erase fail</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>INITSWD:<br/>write fail</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| EI removed                                              | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (EI)                         | slot                             |
| OMON<br>failure                                         | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot<br>(OMON)                    | pack                             |
| OMON<br>removed                                         | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot<br>(OMON)                    | slot                             |
| Circuit<br>breaker/power<br>failure A                   | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Shelf                             | shelf                            |
| Circuit<br>breaker/power<br>failure A<br>and B          | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Shelf                             | shelf                            |
| Circuit<br>breaker/power<br>failure B                   | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Shelf                             | shelf                            |
| unexpected<br>CP type                                   | Yes                    | MN                                    | --                   | --                      | DEFERRED                            | --                   | --                      | Slot (un-<br>known)               | slot                             |
| no CP<br>expected in<br>slot                            | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Slot                              | slot                             |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>       | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                               |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                               |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Set-PM-<br/>Start-Time-<br/>cmptcode</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Set-TH-<br/>OCHAN-<br/>cmptcode</i>                        | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Set-TH-<br/>OLINE-<br/>cmptcode</i>                        | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Set-TH-<br/>OTPS-<br/>cmptcode</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Set-TH-<br/>SUPR-<br/>cmptcode</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Edit-<br/>Password-<br/>ID-cmptcode</i>                    | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Edit-User-<br/>SECU-<br/>cmptcode</i>                      | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Enter-<br/>Channel-<br/>ID-SECU-<br/>cmptcode</i>          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Enter-<br/>Network<br/>Element-<br/>SECU-<br/>cmptcode</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Enter-User-<br/>SECU-<br/>cmptcode</i>               | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| OA failure                                              | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (OA)                         | pack                             |
| OA removed                                              | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (OA)                         | slot                             |
| ODU warmup in progress                                  | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Slot (ODU)                        | pack                             |
| OMU warmup in progress                                  | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Slot (OMU)                        | pack                             |
| BOS failure                                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (BOS)                        | pack                             |
| BOS removed                                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (BOS)                        | slot                             |
| OTU failure                                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (OTU)                        | pack                             |
| OTU removed                                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (OTU)                        | slot                             |
| FLASH failure                                           | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (BOS)                        | pack                             |
| FLASH removed                                           | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (BOS)                        | pack                             |
| Test LED in progress                                    | Yes                    | NR                                    | --                   | --                      | No Report                           | --                   | --                      | System                            | system                           |
| FLASH unrecogni-<br>zable code                          | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (BOS)                        | pack                             |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| FLASH/SYSCTL<br>code mismatch                           | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (BOS)                        | pack                             |
| SUPVY<br>failure                                        | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot<br>(SUPVY)                   | pack                             |
| SUPVY<br>removed                                        | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot<br>(SUPVY)                   | slot                             |
| Incoming<br>SUPVY<br>channel<br>LOS                     | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Port<br>(SUPVY<br>IN)             | supvy                            |
| Incoming<br>SUPVY<br>channel<br>LOF                     | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Port<br>(SUPVY<br>IN)             | supvy                            |
| <b>CPYPGM:<br/>IP tid dest</b>                          | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | System                            | fixed                            |
| <b>CPYPGM:<br/>IP tid src</b>                           | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | System                            | fixed                            |
| <b>CPYPGM:<br/>check fail<br/>tid</b>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <b>CPYPGM:<br/>comm. fail<br/>tid</b>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <b>CPYPGM:<br/>completed<br/>tid dest</b>               | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <b>CPYPGM:<br/>completed<br/>tid src</b>                | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>CPYPGM:<br/>erase fail<br/>tid</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>CPYPGM:<br/>flash busy<br/>tid</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>CPYPGM:<br/>write fail<br/>tid</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| TCA Optics:<br>OLINE<br>(TOPR-OL)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(TOPT-OL)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>SUPVY<br>(SPR-SU)                        | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port<br>(SUPVY<br>IN)             | fixed                            |
| TCA Optics:<br>SUPVY<br>(SPT-SU)                        | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port<br>(SUPVY<br>IN)             | fixed                            |
| TCA Optics:<br>OCHAN<br>(SPR-C)                         | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Channel<br>(Optical)              | fixed                            |
| TCA Optics:<br>OCHAN<br>(SPT-C)                         | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Channel<br>(Optical)              | fixed                            |
| TCA Optics:<br>OTU<br>OC-48/STM-16<br>(OPR)             | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>       | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                               |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                               |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| TCA Optics:<br>OTU<br>OC-48/STM-16<br>(OPT)                   | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| TCA Optics:<br>OTU<br>OC-48/STM-16<br>(LBC)                   | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| TCA Optics:<br>OTU<br>OC-192/STM-64<br>(OPR)                  | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| TCA Optics:<br>OTU<br>OC-192/STM-64<br>(OPT)                  | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| TCA Optics:<br>OTU<br>OC-192/STM-64<br>(LBC)                  | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| <b><i>TCA<br/>Digital:<br/>SUPVY<br/>(CRC)-<br/>tmper</i></b> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port<br>(SUPVY<br>IN)             | --                               |
| <b><i>TCA<br/>Digital:<br/>SUPVY<br/>(ES)-tmper</i></b>       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port<br>(SUPVY<br>IN)             | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>                | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|------------------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                                        |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                                        |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>TCA<br/>Digital:<br/>SUPVY<br/>(BES)-<br/>tmper</i>                 | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port<br>(SUPVY<br>IN)             | --                               |
| <i>TCA<br/>Digital:<br/>SUPVY<br/>(SES)-tmper</i>                      | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port<br>(SUPVY<br>IN)             | --                               |
| <i>TCA<br/>Digital:<br/>SUPVY<br/>(UAS)-<br/>tmper</i>                 | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port<br>(SUPVY<br>IN)             | --                               |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-48/STM-16<br/>(CVS)-<br/>tmper</i>  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-48/STM-16<br/>(ESS)-tmper</i>       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-48/STM-16<br/>(SESS)-<br/>tmper</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>                 | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|-------------------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-48/STM-16<br/>(SEFSS)-<br/>tmper</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |
| inhibit<br>alarms-<br>office<br>alarms                                  | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | System                            | system                           |
| reset in<br>progress                                                    | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | System                            | system                           |
| test alarm in<br>progress                                               | Yes                    | NR                                    | --                   | --                      | No Report                           | --                   | --                      | System                            | system                           |
| Power A for<br>fan1 failure                                             | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Bay                               | bay                              |
| Power A for<br>fan2 failure                                             | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Bay                               | bay                              |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-192/STM-64<br/>(CVS)-<br/>tmper</i>  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-192/STM-64<br/>(ESS)-tmper</i>       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |



**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>                  | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|--------------------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                                          |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                                          |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-192/STM-64<br/>(SESS)-<br/>tmper</i>  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-192/STM-64<br/>(SEFSS)-<br/>tmper</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |
| <i>J0<br/>mismatch</i>                                                   | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU<br>IN)                  | client                           |
| <i>Fan 1<br/>failure</i>                                                 | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Bay                               | bay                              |
| <i>Fan 2<br/>failure</i>                                                 | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Bay                               | bay                              |
| <i>Power B for<br/>Fan 1<br/>failure</i>                                 | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Bay                               | bay                              |
| <i>Power B for<br/>Fan 2<br/>failure</i>                                 | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Bay                               | bay                              |
| <i>Power A<br/>and Power<br/>B for Fan 1<br/>failure</i>                 | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Bay                               | bay                              |
| <i>Power A<br/>and Power<br/>B for Fan 2<br/>failure</i>                 | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Bay                               | bay                              |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>OW1TYPE<br/>Mismatch</i>                             | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Line                              | supvy                            |
| <i>OW2TYPE<br/>Mismatch</i>                             | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Line                              | supvy                            |
| <i>OW3TYPE<br/>Mismatch</i>                             | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Line                              | supvy                            |
| <i>PROVDL-<br/>TYPE<br/>Mismatch</i>                    | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Line                              | supvy                            |
| <i>login:user-id</i>                                    | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>login:user-<br/>id-DENY</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>logout:user-id</i>                                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>logout:user-<br/>id-forced<br/>disconnect</i>        | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>logout:user-<br/>id-remote<br/>link down</i>         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>logout:user-<br/>id-timeout</i>                      | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>intrusion<br/>alert:<br/>user-id</i>                 | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>login<br/>deleted:<br/>user-id</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>login<br/>created:<br/>user-id</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>login<br/>modified:<br/>user-id</i>                  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>login<br/>expired:<br/>user-id</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Logins<br/>inhibited</i>                             | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | System                            | system                           |
| <i>Password<br/>expired:<br/>user-id</i>                | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Sw-Dwnld:<br/>comm. fail</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Sw-Dwnld:<br/>erase fail</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Sw-Dwnld:<br/>flash busy</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Sw-Dwnld:<br/>write fail</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Sw-Dwnld:<br/>completed</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Backup<br/>database<br/>installed</i>                | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Database<br/>original<br/>values<br/>restored</i>    | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>              | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|----------------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                                      |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                                      |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Backup:<br/>comm. fail</i>                                        | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Backup:<br/>completed</i>                                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Flash<br/>access<br/>failure</i>                                  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Restore:<br/>comm. fail</i>                                       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Restore:<br/>format fail</i>                                      | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Restore:<br/>verification<br/>failure</i>                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Restore:<br/>version<br/>mismatch</i>                             | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Restore:<br/>write fail</i>                                       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Restore:<br/>completed</i>                                        | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>Download-<br/>Software-<br/>cmptcode</i>                          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Enter-<br/>Registration<br/>Manager<br/>Attribs-<br/>cmptcode</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>            | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|--------------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                                    |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                                    |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Backup-Database-cmptcode</i>                                    | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Restore-Database-cmptcode</i>                                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Allow-Flash<br/>Memory<br/>Module-<br/>Rmvl-<br/>cmptcode</i>   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Inhibit-Flash<br/>Memory<br/>Module-<br/>Rmvl-<br/>cmptcode</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| Sw-Dwnld:IP                                                        | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | System                            | fixed                            |
| Backup:IP                                                          | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | System                            | fixed                            |
| Restore:IP                                                         | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | System                            | fixed                            |
| Flash<br>removal<br>enabled                                        | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (BOS)                        | pack                             |
| OMS (OA)<br>LOS                                                    | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Port (OA<br>IN)                   | oline                            |
| OMON<br>LOS                                                        | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Port<br>(OMON IN)                 | oline                            |
| WAD<br>incoming<br>optical line<br>LOS                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Line                              | oline                            |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| BC Bus failure                                          | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Bay                               | bay                              |
| Bay Bus failure                                         | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | System                            | system                           |
| OH Bus failure                                          | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | System                            | system                           |
| RM unreachable                                          | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | System                            | fixed                            |
| DSA unreachable                                         | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | System                            | fixed                            |
| Invalid primary DSA address                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | System                            | fixed                            |
| Local SUPVY DL failure                                  | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Line                              | supvy                            |
| Express SUPVY DL failure                                | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Line                              | supvy                            |
| Topology construction in progress                       | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | System                            | system                           |
| Topology construction incomplete                        | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | System                            | system                           |
| Incoming OC-48/STM-16 LOS failure                       | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU IN)                     | client                           |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| Incoming<br>OC-192/STM-64<br>LOS failure                | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU<br>IN)                  | client                           |
| Incoming<br>HSBB LOS<br>failure                         | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU<br>IN)                  | client                           |
| Incoming<br>OCH10G<br>LOS failure                       | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU<br>IN)                  | ochan                            |
| Incoming<br>OC-48/STM-16<br>LOF failure                 | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU<br>IN)                  | client                           |
| Incoming<br>OC-192/STM-64<br>LOF failure                | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU<br>IN)                  | client                           |
| Incoming<br>OCH10G<br>LOF failure                       | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU<br>IN)                  | ochan                            |
| Incoming<br>HSBB LOL                                    | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU<br>IN)                  | client                           |
| OTU<br>LASER shut<br>off                                | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | client                           |
| <i><b>Restore:TID<br/>mismatch<br/>failure</b></i>      | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| Clogged<br>dust filter1                                 | Yes                    | MN                                    | --                   | --                      | DEFERRED                            | --                   | --                      | Bay                               | bay                              |
| Clogged<br>dust filter2                                 | Yes                    | MN                                    | --                   | --                      | DEFERRED                            | --                   | --                      | Bay                               | bay                              |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>                    | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|----------------------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                                            |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                                            |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Abort-<br/>Database-<br/>Backup-<br/>cmptcode</i>                       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| TCA Optics:<br>OTU HSBB<br>(OPR)                                           | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| TCA Optics:<br>OTU HSBB<br>(OPT)                                           | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| TCA Optics:<br>OTU HSBB<br>(LBC)                                           | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-192/STM-64<br/>(FEC-EC)-<br/>tmper</i>  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |
| <i>TCA<br/>Digital:<br/>OTU<br/>OC-192/STM-64<br/>(FEC-<br/>UBC)-tmper</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (OTU<br>IN)                  | --                               |
| <i>Backup:<br/>user-<br/>aborted</i>                                       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| CP not in<br>service<br>indicated                                          | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | Slot                              | slot                             |



**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>OPR-NIS-IND-cmptcode</i>                             | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>RLS-NIS-IND-cmptcode</i>                             | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| <i>Set-Baseline-Oline-TOPR-auto</i> --                  |                        |                                       | --                   | --                      | --                                  | --                   | --                      | Line                              | --                               |
| <i>Set-Baseline-Oline-TOPT-auto</i> --                  |                        |                                       | --                   | --                      | --                                  | --                   | --                      | Line                              | --                               |
| <i>Set-Baseline-Ochan-SPR-auto</i> --                   |                        |                                       | --                   | --                      | --                                  | --                   | --                      | Channel (Optical)                 | --                               |
| <i>Set-Baseline-Ochan-SPT-auto</i> --                   |                        |                                       | --                   | --                      | --                                  | --                   | --                      | Channel (Optical)                 | --                               |
| <i>Set-Baseline-Supr-SPR-auto</i>                       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (SUPVY IN)                   | --                               |
| <i>Set-Baseline-Supr-SPT-auto</i>                       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Port (SUPVY IN)                   | --                               |
| Wave-Wrapper path trace mismatch                        | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Port (OTU IN)                     | ochan                            |
| Circuit Pack Panic and Recovery                         | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Slot                              | --                               |
| SUPVY line-1 and line-2 connection mismatch             | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Line                              | supvy                            |
| Remote Node Ready to Recover                            | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | Line                              | oline                            |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>       | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                               |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                               |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| unexpected<br>channel                                         | Yes                    | --                                    | --                   | MN                      | --                                  | --                   | DEFERRED                | Channel<br>(Optical)              | fixed                            |
| APSD<br>disabled                                              | Yes                    | MJ                                    | --                   | --                      | PROMPT                              | --                   | --                      | System                            | system                           |
| TCA Optics:<br>OTU LSBB<br>(OPR)                              | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| TCA Optics:<br>OTU LSBB<br>(LBC)                              | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Port (OTU<br>IN)                  | fixed                            |
| <i>Enter-<br/>OCHTRC-<br/>cmptcode</i>                        | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Initialize-<br/>Register-<br/>OTPS:port(otps)-cmptcode</i> | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| inhibit<br>orderwire<br>protection<br>switch                  | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | System                            | system                           |
| <i>Edit-ASAP-<br/>Profile-<br/>cmptcode</i>                   | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Enter-<br/>ASAP-<br/>Profile-<br/>cmptcode</i>             | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| <i>Delete-<br/>ASAP-<br/>Profile-<br/>cmptcode</i>            | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| <i>Enter-Profile-Assignment-cmptcode</i>                | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf (UID)                     | --                               |
| Circuit Pack Insertion                                  | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Slot                              | --                               |
| Circuit Pack Removal                                    | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Slot                              | --                               |
| Circuit Pack Ready for retrieve bay                     | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Bay                               | --                               |
| Circuit Pack Ready for retrieve slot                    | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Slot                              | --                               |
| DCM failure                                             | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Port (OA DCM IN)                  | fixed                            |
| <i>PM-FTAM link: reserved</i>                           | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>PM-FTAM link:abort</i>                               | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>PM Upload:IP</i>                                     | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | System                            | fixed                            |
| <i>PM Upload: comm. fail</i>                            | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>PM Upload: read/write fail</i>                       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |
| <i>PM Upload-:completed</i>                             | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | System                            | --                               |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| Automatic<br>Orderwire<br>Protection<br>Switch          | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Line                              | --                               |
| Automatic<br>Orderwire<br>Protection<br>Switch fail     | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Line                              | --                               |
| <b><i>Provision-<br/>System-<br/>cmptcode</i></b>       | --                     | --                                    | --                   | --                      | --                                  | --                   | --                      | Op Intf<br>(UID)                  | --                               |
| TCA Optics:<br>OLINE<br>(PLE-RP1)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-RP2)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-RP3)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-RP4)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-RP5)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-RP6)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-TP1)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup> | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|---------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                         |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                         |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| TCA Optics:<br>OLINE<br>(PLE-TP2)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-TP3)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-TP4)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-TP5)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| TCA Optics:<br>OLINE<br>(PLE-TP6)                       | Yes                    | --                                    | --                   | NA                      | --                                  | --                   | No Alarm                | Line                              | fixed                            |
| WAD ADD<br>LOS                                          | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Port (WAD<br>IN)                  | oline                            |
| Outdated<br>boot flash                                  | Yes                    | NA                                    | --                   | --                      | No Alarm                            | --                   | --                      | Slot                              | pack                             |

**Table A-1 Alarm Condition Table (Events Related To Commands are Italicized) (continued)**

| WaveStar®<br>OLS 1.6T<br>Conditions/Events <sup>1</sup>    | Condition <sup>2</sup> | SONET Original Attribute <sup>3</sup> |                      |                         | SDH Original Attribute <sup>4</sup> |                      |                         | Source<br>Address ID <sup>5</sup> | ASAP Entity<br>Type <sup>6</sup> |
|------------------------------------------------------------|------------------------|---------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-----------------------------------|----------------------------------|
|                                                            |                        | Service<br>Independent                | Service Dependent    |                         | Service<br>Independent              | Service Dependent    |                         |                                   |                                  |
|                                                            |                        |                                       | Service<br>Affecting | Nonservice<br>Affecting |                                     | Service<br>Affecting | Nonservice<br>Affecting |                                   |                                  |
| Clamping<br>transmit OA<br>to output<br>O-channel<br>power | Yes                    | --                                    | --                   | MJ                      | --                                  | --                   | PROMPT                  | Slot (OA)                         | pack                             |

1.

Conditions/Events: Conditions persist in time and Events occur at a particular instance in time. Conditions are identified by a "Yes" in the "Condition" column (which was "CIT Alarm Report") of this table. Events related to commands are italicized. "cmptcode" is used at the end of the TL1 command name in this column. It means that the event is either completed or denied. "tmper" is used at the end of the TCA Digital events and it stands for "time period". It is used to distinguish the message for the 15 minute or 1 day bin. "tmper" can either have the value "15-MIN" or "1-DAY".

2.

Condition: It replaces "CIT Alarm Report". Every row that has a "Yes" in this column is a standing condition. Every standing condition consists of a pair of events: the start of the condition and the "cleared" of the condition. The name of the start event is the name of the condition. The name of the "cleared" event is the condition name with "-cleared" appended to the end of the condition name with no spaces. Every row that has a "--" in this column is an event that is neither associated with the start nor the "cleared" of a standing condition.

3.

SONET Original Attribute (SA/nsa): It is the original value of the SONET Alarm Attribute of the alarm condition (that is, Critical (CR), Major (MJ) or Minor (MN)) and the status condition (that is, Not Alarmed (NA) or Not Reported (NR)).

4.

SDH Original Attribute (SA/nsa): It is the original value of the SDH Alarm Attribute of the alarm condition (that is, PROMPT or DEFERRED) and the status condition (that is, No Alarm (NA) or No Report (NR)).

5.

Source Address ID: It is the location for the Conditions/Events in the system. "Op Intf (UID)", Operational Interface (User ID), is an entry in this column. It is the User login ID that executes the command. OLS 1.6T R1 user default Id is LUC01.

6.

ASAP Entity Type: It consists of the following types: bay, client, com, env, ochan, oline, pack, shelf, slot, supvy, sw, system. They are grouped by ASAP types in the separate sheets labeled below. The fixed type is NOT an ASAP type and it will be shown in italics. The fixed type are those conditions/events that have alarm severity but are non-provisionable. Com is a valid ASAP type but is currently not used.









# Appendix B: Character Set Definitions

## Overview

---

**Purpose** This appendix provides information about the Character Sets available on the WaveStar® OLS 1.6T.

**Contents**

|                                          |                     |
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| <a href="#">Symbolic Character Set</a>   | <a href="#">B-2</a> |
| <a href="#">Numeric Character Set</a>    | <a href="#">B-3</a> |
| <a href="#">Alphabetic Character Set</a> | <a href="#">B-4</a> |



# Symbolic Character Set

---

**Definition** Refer to [Table B-1, “Symbolic Characters” \(B-2\)](#) for the set of symbolic characters for use in User Login ID and Password applications.

**Table B-1 Symbolic Characters**

|   |   |   |   |   |
|---|---|---|---|---|
| ! | * | / | ] |   |
| , | + | < | ^ | } |
| ( | - | > | , | ~ |
| ) | . | [ | { |   |



## Numeric Character Set

---

**Definition** Refer to [Table B-2, “Numeric Character Set” \(B-3\)](#) for the set of numeric characters for use in User Login ID and Password applications.

**Table B-2 Numeric Character Set**

|   |   |   |   |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 |   |   |



# Alphabetic Character Set

---

**Definition** Refer to [Table B-3, “Alphabetic Character Set” \(B-4\)](#) for the set of alphabetic characters for use in User Login ID and Password applications.

**Table B-3 Alphabetic Character Set**

|   |   |   |   |
|---|---|---|---|
| A | B | C | D |
| E | F | G | H |
| I | J | K | L |
| M | N | O | P |
| Q | R | S | T |
| U | V | W | X |
| Y | Z | a | b |
| c | d | e | f |
| g | h | i | j |
| k | l | m | n |
| o | p | q | r |
| s | t | u | v |
| w | x | y | z |





# Glossary

## **A ABN**

Abnormal (condition).

### **Access Identifier (AID)**

A unique identifier used to address equipment slots and ports, as well as facility tributaries, that are defined for the OLS architecture.

### **ACO**

Alarm Cutoff

### **AGNE**

Alarm Gateway Network Element

### **AID**

Access Identifier

### **AIM**

Alarm Indication Message

### **AIS**

Alarm Indication Signal

### **Alarm**

A visible or audible signal that indicates a communication, equipment, or processing failure has occurred.

### **Alarm Cut-Off (ACO)**

A push-button switch on the indicator strip that can be used to retire an audible office alarm.

### **Alarm Gateway Network Element (AGNE)**

A defined Network Element in an alarm group through which members of the alarm group exchange information.

**Alarm Indication Signal (AIS)**

A code transmitted downstream in a digital network indicating that an upstream failure has been detected and alarmed if the upstream alarm has not been suppressed.

**Alarm List**

A status report that lists active alarms on the network element.

**Alarm Log**

A history of the setting and clearing of system alarms on the network element.

**Alarm Severity**

An attribute defining the priority of the alarm message. The way alarms are processed depends on the severity.

**Alarm Suppression**

Selective removal of alarm messages from being forwarded to the GUI or to network management layer OSs.

**Alarm Throttling**

A feature that automatically or manually suppresses autonomous messages that are not priority alarms.

**Aligning**

Indicating the head of a virtual container by means of a pointer, for example, creating an Administrative Unit (AU) or a Tributary Unit (TU).

**Alternate Mark Inversion (AMI)**

A line code that employs a ternary signal to convert binary digits, in which successive binary ones are represented by signal elements that are normally of alternative positive and negative polarity but equal in amplitude, and in which binary zeros are represented by signal elements that have zero amplitude.

**American Standard Code for Information Interchange (ASCII)**

A standard 7-bit code that represents letters, numbers, punctuation marks, and special characters in the interchange of data among computing and communications equipment.

**Amplitude**

Amplitude is a measure of the intensity of the wave and is defined as the distance from the center of the wave to its peak (half the distance from peak to peak).

**APD**

Avalanche Photo Diode

**APSD**

Automatic Power Shutdown

**Area**

A group of nodes in which there is only IS-IS Level 1 routing of traffic. Nodes in an Area do not maintain detailed routing information to nodes outside the area.

**Area Address**

A variable length quantity consisting of the entire high order part of the Network Service Access Point (NSAP) excluding the 6 byte System Identifier (SID) and Selector (SEL). Used for interarea routing through the Level 2 subdomain.

**Area ID**

A user provisionable four digit (Hex) number that is used for IS-IS routing purposes in a network.

**Asynchronous**

Refers to network elements that are not timed from references traceable to a single Stratum-1 source.

**Attribute**

Alarm indication level: critical, major, minor, or no alarm.

**AUTO**

Automatic

**Automatic (AUTO)**

One possible state of a port or slot. When a port is in the AUTO state and a good signal is detected, the port automatically enters the IS (in-service) state. When a slot is in the AUTO state and a circuit pack is detected, the slot automatically enters the EQ (equipped) state.

**Automatic Power Shutdown (APSD)**

A safety procedure automatically performed by the OLS when a loss of optical power occurs. APSD powers down the Optical Amplifier to safe, Class 1 levels then restarts it once the system has been repaired or links have been re-established.

**Automatic Protection Switch**

A protection switch that occurs automatically in response to an automatically detected fault condition.

**Avalanche Photo Diode (APD)**

APD is a receiver that translates optical signals back to electrical pulses.

---

**B Backup**

The backup and restoration features provide the capability to recover from loss of NE data because of such factors as human error, power failure, NE design flaws, and software bugs.

**Bandwidth**

The difference in Hz between the highest and lowest frequencies in a transmission channel. The data rate that can be carried by a given communications circuit.

**Baud Rate**

Transmission rate of data (bits per second) on a network link.

**Bay**

A hardware frame in which shelves are mounted and housed.

**BCLAN**

Board Controller Local Area Network

**BER**

Bit Error Rate

**BES**

Bursty Errored Second Count

**Bidirectional Line**

A transmission path consisting of two fibers that handle traffic in both the transmit and receive directions.

**BIP-N**

Bit Interleaved Parity

**Bit**

The smallest unit of information in a computer, with a value of either 0 or 1.

**Bit Error Rate (BER)**

BER measures how accurately a bit stream is transmitted through a system. It measures how many bits are received in error compared to how many are sent.

**Bit Error Rate Threshold**

The point at which an alarm is issued for bit errors.

**Bit Interleaved Parity-N (BIP-N)**

A method of error monitoring over a specified number of bits (BIP-3 or BIP-8).

**Board Controller Local Area Network (BCLAN)**

The internal local area network that provides communications between the line and board controllers on the circuit packs associated with a high-speed line.

**BOS**

Bay/Overhead/System controller



**BRM**

Bit Rate Map

**Broadband Communications**

Voice, data, and/or video communications at greater than 2 Mb/s rates.

**BW**

bandwidth

**Byte**

Refers to a group of eight consecutive binary digits.

---

**C C+L Separator and Combiner (CLSC) Apparatus Units**

The CLSC apparatus unit combines two independent DWDM line systems (one using the C-band, and the other using the L-band) onto a single fiber pair. In transmission paths, Single C+L Separator and Combiner (CLSC-S) and Double C+L Separator and Combiner (CLSC-D) apparatus units are used for C+L applications. CLSC-S is used in terminal systems, and CLSC-D is used in repeater/ring sites.

**CCITT**

Comité Consultatif International Télégraphique et Téléphonique. See ITU-T.

**CD-ROM**

compact disk–read-only memory

**Central Office (CO)**

A building where common carriers terminate customer circuits.

**Channel**

A sub-unit of transmission capacity within a defined higher level of transmission capacity.

**Circuit Pack (CP)**

A single field-replaceable electronic or opto-electronic unit. It comprises mechanical piece-parts, electronic components, and their associated connections and performs a specific function.

**CIT**

Craft Interface Terminal

**CIT-PC**

PC Based Craft Interface Terminal

**CLEI**

Common Language Equipment Identifier

**Closed Ring Network**

A network formed of a ring-shaped configuration of network elements. Each network element connects to two others, one on each side.

**CLSC**

C+L Separator and Combiner apparatus unit

**CLSC-D**

C+L Separator and Combiner apparatus unit with Double Separator and Combiner functions

**CLSC-S**

C+L Separator and Combiner apparatus unit with Single Separator and Combiner functions

**CMISE**

Common Management Information Service Element

**CMS**

See customer maintenance signal

**CO**

Central Office

**CO-LAN**

central office local area network

**Coding Violation (CV)**

A performance monitoring parameter indicating that bipolar violations of the signal have occurred.

**Collocated**

Located in the same Central Office

**Comcode**

Lucent Technologies ordering code for cables and other equipment.

**Common Language Equipment Identifier (CLEI)**

Codes that are assigned by Bellcore to provide a standard method of identifying telecommunications equipment in a uniform, feature-oriented language. Bellcore GR-485-CORE specification contains generic guidelines for Common Language Equipment Coding Processes and Guidelines.

**Common Management Information Service Element (CMISE)**

Entities that the Common Management Information Protocol (CMIP) uses to communicate. CMISE exchanges network management information between two management systems, or between a management system and an application. CMIP/CMISE is designed for OSI networks,

but it is transport independent.

**Concatenation**

A procedure whereby multiple virtual containers are associated one with each other resulting in a combined capacity that can be used as a single container across which bit sequence integrity is maintained.

**Configuration Management (CM)**

Subsystem that configures the network and processes messages from the network.

**Consultative Committee for the International Telephone and Telegraph (CCITT)**

International Telephone and Telegraph Consultative Committee — An international advisory committee under United Nations' sponsorship that has composed and recommended for adoption worldwide standards for international communications. Recently changed to the International Telecommunications Union Telecommunications Standards Sector (ITU-TSS).

**CPM**

Cross Phase Modulation (same as XPM)

**CR**

Critical (alarm)

**Craft Interface Terminal (CIT)**

The user interface terminal that meets OLS minimum requirements and is used by craft personnel to communicate with a network element.

**Craft Interface Terminal - Personal Computer (CIT- PC)**

A personal computer that meets OLS minimum requirements and is used by craft personnel to communicate with a network element.

**CRC**

Cyclic Redundancy Check

**Critical (CR)**

Alarm that indicates a severe, service-affecting condition.

**CS&O**

Lucent Technologies Customer Support and Operations

**CTAM**

Customer Technical Assistance Management

**CTNEQPT**

Facility/circuit interconnection equipment failure. This condition type is for internal optical LOS defects (fiber connections) between CPs.

**Current Value**

The value currently assigned to a provisionable parameter.

**CV**

Coding Violation

**CVS**

Coding Violation Count - Section Near End

**Cyclic Redundancy Check (CRC)**

A method of error detection using cyclic redundancy code. A CRC value is generated at the transmitting terminal, based on the contents of the message transmitted. An identical CRC generation is performed at the receiving terminal and if it does not match, the message was received incorrectly.

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**D Data**

A collection of system parameters and their associated values.

**Data Communication Network (DCN)**

The Data Communication Network (DCN) supports communications between WaveStar® OLS 1.6T and the network management system (SNMS). OSI based networks, formed by Q-LAN and SDL overhead bytes, performs the communications between the SNMSs and the manages NEs (OLS).

**Data Communications Channel (DCC)**

The embedded overhead communications channel in the synchronous line, used for end-to-end communications and maintenance. The DCC carries alarm, control, and status information between network elements in a synchronous network.

**Data Communications Equipment (DCE)**

The equipment that provides the signal conversion and coding between the data terminating equipment and the line. The DCE may be separate equipment or a part of the data terminating equipment.

**Data Terminating Equipment (DTE)**

The equipment that originates data for transmission and accepts transmitted data.

**dB**

Decibels

**dBm**

Decibels relative to 1 milli-watt

**DCC**

Data Communications Channel

**DCE**

Data Communications Equipment

**DCM**

Dispersion Compensation Module

**DCN**

Data Communication Network

**DCN**

Refer to Data Communication Network

**DDM-2000**

Lucent Technologies SONET-ready network multiplexer that can function as a lightwave terminal. It is designed primarily for loop feeder and interoffice applications that will work in existing asynchronous as well as the emerging SONET networks.

**Dedicated Protection Ring (DP-Ring)**

A protection method used in ISM Network Elements.

**Default**

An operation or value that the system or application assumes, unless a user makes an explicit choice.

**Default Provisioning**

The parameter values that are preprogrammed as shipped from the factory.

**Demultiplexer**

A device that splits a combined signal into individual signals at the receiver end of transmission.

**Demultiplexing**

A process applied to a multiplexed signal for recovering signals combined within it and for restoring the distinct individual channels of these signals.

**Dense Wavelength Division Multiplexing (DWDM)**

Transmitting two or more signals of different wavelengths simultaneously over a single fiber.

**Designated Router**

Function of the IS-IS protocol. A Pseudo or Virtual node on the LAN subnet, which assumes much of the routing tasks for the LAN circuit. One of the physical nodes does the actual work. This node is the Designated Router (DR). Election of the DR depends first on the circuit

priority and second on the SID (or MAC address).

**Designated Router Priority**

The routing priority level assigned to a node. The value of this parameter is used for the selection of the designated router per area on a LAN. The node with the highest priority will fulfill the designated router function. If two nodes that the same priority level, then the SID (MAC address) is used to select a designated router.

**DFB**

Distributed Feed Back

**Digital Link**

A transmission span such as a point-to-point 2 Mb/s, 34 Mb/s, 140 Mb/s, VC12, VC3 or VC4 link between controlled network elements. The channels within a digital link are insignificant.

**Digital Multiplexer**

Equipment that combines several digital signals into a single composite digital signal by time-division multiplexing.

**Directory Service Network Element (DS-NE)**

A designated network element that is responsible for administering a database that maps network element names (TIDs) to addresses [NSAPs (network service access points)]. There can be one DS-NE per ring.

**Directory System Agent (DSA)**

The Directory System Agent maintains the directory database and accesses the directory database on behalf of the requesting directory user agent; resides on SNMS.

**Dispersion**

The phenomenon in which different wavelengths or different polarizations of light travel at different speeds through a fiber optic cable.

**Dispersion Compensation Fiber (DCF)**

A special fiber with high negative value of dispersion. It is used as an inline pre- or post-equalization in the form of a fiber spool placed at the end of a link.

**Dispersion Compensation Module (DCM)**

The Dispersion Compensating Module (DCM) is used to overcome chromatic dispersion limits of the transmission fiber. The DCM is a passive module containing dispersion compensation fiber that offsets the outside fiber plant.

**Dispersion Shifted Fiber**

Optical fiber that uses a different internal configuration, which changes the chromtic dispersion point to 1330/1550 nm minimum dispersion wavelength.

**Divergence**

When the OA provides unequal amplification of incoming wavelengths, the result is a power divergence between wavelengths.

**DLP**

Detail Level Procedure

**Domain**

A set of OLS nodes/entities that are interconnected to perform some specific function in a network (for example, manager-domain where all nodes are managed by the same manager or group of managers.)

**Doping**

The addition of impurities to a substance in order to attain desired properties.

**DRAM**

Dynamic Random Access Memory

**Drop Side Signal**

An optical signal suitable for transmission over OLS.

**DS-NE**

Directory Service Network Element

**DS3**

Digital Signal Level 3 (44.736 Mb/s)

**DSA**

Refer to Directory System Agent.

**DSF**

Dispersion Shifted Fiber

**DTE**

Data Terminating Equipment

**Dual Ring Interworking**

A configuration of two ring networks that share two common nodes. DRI permits a circuit with one termination in one ring and one termination in another ring to survive a loss-of-signal failure of the shared node that is currently carrying service for the circuit.

**DWDM**

Dense Wavelength Division Multiplexing

**Dynamic Random Access Memory (DRAM)**

RAM which requires electronic refresh cycles every few milliseconds to preserve its data.

**Dynamic Routing on a LAN**

No pre-defined ethernet address is used for routing from SNMS to a managed NE. The IS on the LAN that receives the messages will notify the ES (SNMS) when a better route is available.

---

**E EC-1**

Electrical Carrier level-1 signal

**ECI**

Equipment Catalog Item

**EDFA**

Erbium Doped Fiber Amplifier

**EEPROM**

Electrically Erasable Programmable Read-Only Memory

**EI**

External Interface

**Electrical Carrier Level- 1 (EC-1)**

An STS-1 signal that has been shaped and encoded for transmission over electrical media.

**Electromagnetic Compatibility (EMC)**

A measure of equipment tolerance to external electromagnetic fields.

**Electromagnetic Interference (EMI)**

High-energy, electrically induced magnetic fields that cause data corruption in cables passing through the fields.

**Electromagnetic Spectrum**

The different wavelengths of light in the visible spectrum (light the human eye can see), that appear as different colors.

**Electronic Industries Association (EIA)**

A trade association of the electronic industry that establishes electrical and functional standards.

**Electrostatic Discharge (ESD)**

Static electrical energy potentially harmful to circuit packs and humans.

**EMC**

Electromagnetic Compatibility

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**EMI**

Electromagnetic Interference

**EML**

Electro-absorption Modulated Laser

**End Terminal**

The OLS equipment that terminates up to eighty (80) optical line signals.

**Engineering Rules**

A set of rules that determine OLS system configuration possibilities based on fiber type, OA, rate and number of wavelengths. These rules determine the maximum loss per span that can be tolerated, the maximum distance between spans allowed and the maximum number of spans that can be supported.

**EOL**

End Of Life

**EQ**

Equipped

**Equipped (EQ)**

A memory administrative state for slots.

**Erbium**

A soft rare earth element used in metallurgy and nuclear research.

**Erbium Doped Fiber Amplifier (EDFA)**

An amplifier that performs by having a light signal pass through a section of erbium- doped fiber and using the laser pump diode to amplify the signal.

**Errored Seconds (ES)**

A performance monitoring parameter.

**ES**

Errored Seconds

**ESD**

Electrostatic Discharge

**ESS**

Errored Second Count - Section Near End

**ET**

End Terminal

**Event**

1. A fault, inconsistency, or communication problem. 2. An autonomous message put out by the system to indicate that a fault or inconsistency has occurred; messages appear in a craft interface window as they occur and can indicate trouble or be solely informational.

**Express Traffic**

In a WAD site, wavelengths going between two co-located OLS end terminals without going through an LCT.

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**F Failures in Time (FIT)**

Circuit pack failure rates per 10<sup>9</sup> hours as calculated using the method described in *Reliability Prediction Procedure for Electronic Equipment*, Issue 4, September 1992.

**Far End (FE)**

Any other network element in a maintenance subnetwork other than the one the user is at or working on. Also called remote.

**Far-End Receive Failure (FERF)**

An indication returned to a transmitting Network Element that the receiving Network Element has detected an incoming section failure. Also known as RDI (Remote Detect Indication).

**Far-End-Block Error (FEBE)**

An indication returned to the transmitting terminal that an errored block has been detected at the receiving terminal. A block is a specified grouping of bits.

**Fault**

Term used when a circuit pack has a hard (not temporary) fault and cannot perform its normal function.

**Fault Management**

Collecting, processing, and forwarding of autonomous messages from network elements.

**FDI**

Forward Defect Indicator

**FE ACTY**

Far-End Activity

**FEBE**

Far-End-Block Error

**FEC**

Forward Error Correction

**FERF**

Far End Receive Failure. See RDI.

**FIT**

Failures in Time

**Forward Error Correction (FEC)**

A technique used for error detection and correction in which the transmitting host computer includes some number of redundant bits in the payload (data field) of a block or frame of data. The receiving device uses those bits to detect, isolate and correct any errors created in transmission. FEC avoids having to retransmit information which incurred errors in network transit.

**Frequency**

The frequency of a wave indicates how frequently it cycles or changes. It is the number of cycles per one second intervals. Frequency is usually measured in Hertz.

**FTP**

file transfer protocol

**FWM**

Four Wave Mixing

---

**G Gateway Network Element (GNE)**

A Gateway Network Element (GNE) is a WaveStar® OLS 1.6T node that has a physical attachment to the SNMS to support the access of the remote Network Elements. The number of remote NEs a GNE can serve is specified in terms of the number of OSI stack associations the GNE can support without running out of local resources.

**GB**

gigabyte

**Gb/s**

Gigabits per second

**GHz**

Gigahertz

**GNE**

Gateway Network Element

**GUI**

Graphical User Interface

---

## **H Hazard Level**

Output power level of an OLS system or device that poses safety risks to personnel. For 1550 nm wavelengths, hazard levels are defined as follows:

- Level 1 = > 10 dBm
- Level 1M = > 21.3 dBm
- Level 3B = > 27 dBm
- Level 4 = > 27 dBm

### **High Speed Broadband (HSBB) Optical Translator Unit**

The High Speed Broadband Optical Translator Unit (HSBB OTU) translates incoming wavelengths into those compatible with the OLS 400G. The HSBB OTU is capable of handling SONET/SDH and other asynchronous optical signals within the broadband range.

### **Hop**

Span across a LAN or between nodes, such as from an End Terminal to a Repeater, or from Repeater to Repeater.

### **Hop**

Span across a LAN or between Nodes, such as from an End Terminal to a Repeater, or from Repeater to Repeater.

### **HSBB**

High Speed Broadband

### **Hz**

Hertz

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## **I IAOLAN**

IntrAOffice Local Area Network

### **IEC**

International Electrotechnology Commission or Interexchange Carrier

### **In-Service (IS)**

A memory administrative state for ports. IS refers to a port that is fully monitored and alarmed.

### **Intermediate System**

A node in the OLS network that performs the router and forwarding function. An OLS node behaves both as an ES as well as an IS node.

### **Intermediate System to Intermediate System (IS-IS)**

IS-IS is a routing exchange protocol (OSI Network Layer Routing Protocol).

**IR**

Intermediate Reach

**IS**

In Service

**IS Level 1**

All nodes in a single Area use IS-IS Level 1 OSI routing protocol for routing traffic.

**IS Level 2**

IS-IS protocol is provisioned when the number of OLS nodes has exceeded the maximum level of nodes that can be managed and the nodes are separated into Areas. IS Level 2 is used for communication between Areas. IS Level 2 protocol works only between OLS nodes that are designated as Level 2 nodes.

**IS-IS**

Intermediate System to Intermediate System

**ITCO**

Independent Telephone Company

**ITU-T**

International Telecommunications Union–Telecommunications

**IXC**

Interexchange Carrier

**IXL**

Index List

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**J Jitter**

Jitter is defined as short-term variations of the significant instants of a digital signal from their ideal positions in time.

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**K Kb/s**

Kilobits per second

**km**

kilometer

**Krypton line**

1547.82 nm —wavelength used in a standard laser source.

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**L LAN**

Local Area Network

**LBC**

Laser bias current

**LBC-P**

Laser Bias Current for Pump

**LBC-SU**

Laser Bias Current - Supervisory

**LBFC**

Laser backface currents

**LBFC-P**

Laser Backface Current for Pump

**LBO**

Lightguide Build-Out

**LC**

Lucent - made connector, 0.1 dB typical loss

**Lead time**

The amount of time that passes between placement of a product order and receipt of the product.

**LEC**

Local exchange carrier

**LED**

Light-emitting diode

**Level 1 Node**

A Level 1 Node has the capability of communicating with all Level 1 Nodes in the Area of which it is a member. Level 1 Nodes cannot communicate with nodes outside of its own area. The Node can be an external router or an OLS 400G.

**Level 1 Ring**

A Level 1 Ring is composed of only Level 1 Nodes. A Level 2 Node performing as both a Level 2 Node and a Level 1 Node can be part of the Level 1 Ring.

**Level 2 Node**

A Level 2 Node can communicate with other Level 2 Nodes in its subdomain. This provides the ability for communications between Areas via the Level 2 Nodes. In addition, the Level 2 Node communicates with the Level 1 Nodes in its Area. The Node can be an external router or OLS 400G.

**Level 2 Ring**

A set of Level 2 Nodes located within the same routing domain that connects all areas of the OLS network.

**Level 2 Subdomain**

A set of Level 2 Nodes located within the same routing domain that connects all areas of the OLS network.

**LFA**

Loss of Frame Assignment

**LGX**

Lightguide cross-connect.

**Lightguide Build-Out (LBO)**

An adapter for the lightguide fiber jumpers between the LGX, OLS, and OT equipment. It is also used on equipment within the network element. It performs signal attenuation and guarantees the proper signal level to OLS and OT equipment.

**Line**

**1.** An optical transmission line. In T1/Bellcore terminology, "line" refers to a transmission medium, together with the associated high speed equipment, required to provide the means of transporting information between two consecutive network elements; one originates the line signal while the other terminates it. **2.** "Line" also indicates a fiber pair. When used in this document, the following is assumed: 1 line = 2 fibers, 4 line = 8 fibers.

**Line Build-out (LBO)**

An attenuator placed between a Lightwave system and the LGX (equivalent.) It guarantees the optical level will be below the receiving equipment's maximum received power requirements.

**LIU**

Line Interface Unit

**Local Area Network (LAN)**

A communications network that covers a limited geographic area, is privately owned and user administered, is mostly used for internal transfer of information within a business, is normally contained within a single building or adjacent group of buildings, and transmits data at a very rapid speed.

**Local Traffic**

All wavelengths being added/dropped through LCTs or OTs at a WAD site.

**LOF**

Loss of Frame

**LOL**

Loss of Lock

**Long Reach (LR)**

A standard for optics, concerning transmitters and receivers in a system and ensuring that transmission can be maintained for long distances (tens of kilometers). This standard constrains the output power of the transmitter and the sensitivity of the receiver for long-haul applications (up to 80 km) without the need for regeneration.

**LOS**

Loss of Signal

**Loss Budget**

Loss (in dB) of optical power due to the span transmission medium (includes fiber loss and splice losses).

**Loss of Frame (LOF)**

A failure to synchronize to an incoming signal.

**Loss of Pointer (LOP)**

A failure to extract good data from a signal payload.

**Loss of Signal (LOS)**

The complete absence of an incoming signal.

**Low Speed Broadband (LSBB) Optical Translator Unit**

The Low Speed Broadband (LSBB) Optical Translator Unit (OTU20) consists of two independent optical translators each operating at bit rates from 45 Mb/s to 750 Mb/s. The OTU receives two compatible optical signals between 1300 nm and 1565 nm, and converts them into electrical signals, which are then amplified and regenerated. These electrical signals are then converted back into optical signals and are transmitted in the 1550 nm band.

**LSBB**

Low Speed Broadband

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**M Maintenance Subnetwork**

A group of network elements that are connected either in an open ring with an End Terminal at each end, or a closed ring via an optical supervisory data link. A network topology map of the



maintenance subnetwork can be generated via any one of the network elements in the local transmission ring.

**Menu**

A set of possible values for a parameter.

**MHz**

megahertz

**Midspan Meet**

The capability to interface between two lightwave terminals of different vendors. This applies to high speed optical interfaces.

**MJ**

Major (alarm)

**mm**

Micrometer

**MN**

Minor (alarm)

**Mode**

A discrete optical wave that can propagate through a fiber.

**MTBF**

Mean Time Between Failures

**MTBMA**

Mean Time Between Maintenance Activities

**Multimode Fiber (MMF)**

A fiber with a core (the glass center of the fiber which light travels through) larger than Single Mode Fiber so that more than one wave can pass through it. It is primarily deployed for short distances.

**Multiplexing**

The process of combining several distinct digital signals into a single composite digital signal.

**MZ**

Mach-Zender

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**N NA**

Not Alarmed

**NE**

Network Element

**NE ACTY**

Near-End Activity

**NEBS**

Network Equipment-Building System

**Network Element (NE)**

A node in a telecommunication network that supports network transport services and is directly manageable by a management system.

**Network Monitoring and Analysis (NMA)**

An operations system designed by Telcordia which is used to monitor network facilities.

**Network Service Access Point Address (NSAP Address)**

An automatically assigned number that uniquely identifies a Network Element for the purposes of routing DCC messages.

**NG-OLS**

Next Generation Optical Line System

**nm**

Nanometer (10<sup>-9</sup> meters)

**NMA**

Network Monitoring and Analysis System

**NMON**

Not Monitored

**Node**

An End System and/or Intermediate System in a DCN. Examples of Lucent Nodes are OLS 400G and SNMS.

**Non-revertive switching**

In non-revertive switching, a working and stand-by line exist on the network. When a protection switch occurs, the standby line is selected to support traffic, thereby becoming the working line. The original working line then becomes the stand-by line. This status remains in effect even when the fault clears. That is, there is no automatic switch back to the original status.

**Not Monitored (NMON)**

A memory administrative state for ports.

**NR**

Not Reported

**NRZ**

Non-return to zero

**NSA**

Nonservice Affecting

**NSAP Address**

Network Service Access Point Address

**NZDSF**

Non-Zero Dispersion Shifted Fiber

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**O O&M**

Operation and Maintenance

**O&M**

Operation and Maintenance

**OA**

Optical Amplifier

**OALAN**

Overhead Access Local Area Network

**OAM&P**

Operations, Administration, Maintenance, and Provisioning

**OC, OC-n**

Optical Carrier

**OCAIM**

optical channel alarm indication message

**OCHAN**

Optical Channel

**ODU**

Optical Demultiplexer

**OLS**

Optical Line System

**OMON**

Optical Monitoring Circuit

**OMU**

Optical Multiplexer Unit

**OOF**

Out-of-Frame

**OOS**

Out-of-Service

**OOS-MA**

out of service—manual

**OOS-MA-AS**

A provisioning state for slots and ports. It is not an acronym, an abbreviation, or a shortened form of anything. It is always written in capital letters.

**Open Ring Network**

Network formed of a point-to-point configuration of systems.

**Open System Interconnection Data Communication Network (OSI DCN)**

based on the OSI 7-Layer protocol for transfer of data between systems.

**Open Systems Interconnection (OSI)**

Referring to the OSI reference model, a logical structure for network operations standardized by the International Standards Organization (ISO).

**Operations Interface**

Any interface providing you with information on the system behavior or control. These include the equipment LEDs, interface strip, CIT, office alarms, and all telemetry interfaces.

**Operations Interworking**

The capability to access, operate, provision, and administer remote systems through craft interface access from any site in a SONET network or from a centralized operations system.

**Operations System (OS)**

A central computer-based system used to provide operations, administration, and maintenance functions.

**OPR**

Optical Power Received - Optics

**OPROOS**

Out-of-Service

**OPT**

Optical Power Transmitted - Optics

**Optical Amplifier (OA)**

The Optical Amplifier operates in the 1530 nm to 1563 nm band (191.850 THz - 195.900 THz range), and provides a uniform gain for up to 80 channels.

**Optical Carrier (OC, OC-n)**

The optical signal that results from an optical conversion of an STS signal; that is, OC-1 from STS-1 and OC-n from STS-n.

**Optical Carrier 12/Synchronous Transport Module 4 (OC12/STM4)**

The OC12/STM4 port unit provides a bidirectional port at the OC-12 rate.

**Optical Carrier 192/Synchronous Transport Module 64 (OC192/STM64)**

The OC192/STM64 port unit provides a bidirectional port which is provisionable at either the OC-192- or STM-64-rate.

**Optical Carrier 48/Synchronous Transport Module 16 (OC48/STM16)**

The OC48/STM16 port unit provides a bidirectional port which is provisionable at either the OC-48- or STM-16-rate.

**Optical Channel (OCHAN)**

An OC-N/STM-N wavelength within an optical line signal. Multiple channels, differing by 1.5m in wavelength, are multiplexed into one signal.

**Optical Demultiplexer (ODU)**

An ODU takes the OLS optical signal and separates it into its component signals; up to eighty (80) discrete signals may be extracted.

**Optical Line ID**

A portion of the supervisory signal that identifies optical lines to prevent wrong connections between sites.

**Optical Line Signal**

A multiplexed optical signal containing eight wavelengths or channels.

**Optical Line System (OLS)**

A lightwave transmission system that can multiplex up 8, 16, 80 or more wavelengths, transmit the resulting multiplexed signal, and then demultiplex the signal at the other end.

**Optical Line System (OLS) End Terminal**

Terminal equipment consisting of a co-located Optical Multiplexer Unit (OMU) and Optical Demultiplexer Unit (ODU) for bidirectional transmission, Optical Amplifiers (OA), and OLS Telemetry packs.

**Optical Line System (OLS) Repeater Terminal**

Bidirectional terminal consisting of a pair of Optical Amplifiers (OA) and the corresponding OLS telemetry packs.

**Optical Line System (OLS) Subnetwork**

All dual-facing end terminals and OLS Repeaters interconnected with each other. The dual-facing shelf feature extends the access domain beyond the end terminals.

**Optical Monitoring Circuit (OMON)**

The OMON determines the number of channels (wavelengths) present in the WaveStar® OLS 1.6T system, and the output power of each channel present.

**Optical Multiplexer Unit (OMU)**

An OMU takes up to 80 Low Speed Broadband (LSBB), High Speed Broadband (HSBB), or **OC-48**/STM-16 signals and combines them into a single signal.

**Optical Section**

Refer to *Span*.

**Optical Translator Unit (OTU)**

OTUs translate incoming optical signals to wavelengths compatible with OLS.

**Optical WAD**

Refer to *Wavelength Add/Drop*.

**Orderwire**

A section of the supervisory signal that is used for communication between sites.

**Original Value Provisioning**

The original values are preprogrammed at the factory. These values can be overridden using local or remote provisioning.

**OS**

Operations System

**OSI**

Open System Interface

**OSI DCN**

Open System Interconnection Data Communication Network

**OSNR**

Optical Signal to Noise Ratio

**OSNR-C**

Optical Signal to Noise Ratio - Channel

**OSS**

Operations Support System

**OT**

Optical Translator

**OTCTL**

Optical Translator Controller

**OTPM**

Optical Translator Port Module

**OTU**

Optical Translator Unit

**Out-of-Service (OOS)**

The circuit pack is not providing its normal service function (removed from either the working or protection state) either because of a system problem or because the pack has been removed from service.

**Outage**

A disruption of service that lasts for more than 1 second.

**Overhead Access Local Area Network (OALAN)**

The internal local area network that provides communications between the System Controller circuit pack and the Overhead Controller circuit pack.

**OW**

OrderWire

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**P Parallel Telemetry**

A set of alarms and status information reported to an operations center.

**Parameter**

A variable that is given a value for a specified application. A constant, variable, or expression that is used to pass values between components.

**Parity Check**

Tests whether the number of ones (or zeros) in an array of binary bits is odd or even; used to determine that the received signal is the same as the transmitted signal.

**Path Overhead (POH)**

Overhead assigned to and transported with the payload until the payload is demultiplexed. It is used for functions that are necessary to transport the payload.

**PC**

standard-type connector, 0.3 dB typical loss

**PCM**

Pulse Code Modulation

**Performance Monitoring (PM)**

Measures the quality of service and identifies any degrading or marginally operating systems (before an alarm would be generated).

**PID**

Private Identifier (Password)

**PIN**

A type of photodiode.

**Platform**

In OLS, a platform is a family of equipment and software configurations designed to support a particular application.

**Plesiochronous**

Refers to network elements involved in multiple digital synchronous circuits running at different clock rates.

**PM**

Performance Monitoring

**POH**

Path Overhead

**Port**

A system interface for transmission, as input, output, or bidirectional.

**PRD**

Product Requirements Document



**Preprovisioning**

The capability to provision a slot before installing a circuit pack.

**Private Identifier (PID)**

Password

**Proactive Maintenance**

Refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending signal fail or signal degrade defect.

**Protection Switching**

The switching of traffic from a malfunctioning line to one that is working.

**PROTN**

Protection

**Provisioning**

Assigning a value to a system parameter.

**Pump Laser Efficiency (PLE)**

The PLE provides an indication of the level of performance of pump lasers of the OA.

**PWR**

Power

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**Q QOS**

Quality of Service

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**R RCV**

Receive

**RDI**

Remote defect indicator

**Reactive Maintenance**

Refers to discovering defects/failures and then clearing them.

**Regeneration**

The process of reconstructing a digital signal to eliminate the effects of noise and distortion.

**Remote defect indicator (RDI)**

Previously called far-end-receive failure (FERF), an indication returned to a transmitting terminal that the receiving terminal has detected an incoming section failure.

**Remote failure indication (RFI)**

Previously called yellow signals, a signal that alerts upstream STS-1 path terminating equipment that a down stream failure has been alarmed along the STS-1 path. This action prevents multiple alarms from being activated for the same failure and ensures that craft will be dispatched to the correct location of the failure.

**Repeater**

A repeater is an optical device that receives an optical signal, amplifies it and re-transmits it.

**Repeater Terminal**

In OLS, a bidirectional terminal consisting of a pair of optical amplifiers and the corresponding telemetry packs.

**RF**

Radio Frequency

**RFI**

Remote failure indication

**Ring**

A series of nodes connected in a "ring" topology so that if there is a failure of a node or a link, traffic can be routed in the opposite direction of the failure and reach all nodes on the ring.

**RM ACTY**

Remote Activity

**Router**

An interface between two networks. While routers are like bridges, they work differently. Routers provide more functionality than bridges. For example, they can find the best route between any two networks, even if there are several different networks in between. Routers also provide network management capabilities such as load balancing, partitioning of the network, and trouble-shooting.

**Routing Domain**

A collection of End Systems and Intermediate Systems which operate according to the same routing procedures and which is operated by a single administrative authority.

**RPP**

Reliability Prediction Procedure

**RT**

Remote Terminal

**RTAC**

Regional Technical Assistance Center

**Rx**  
receive

---

**S SA**  
Service Affecting

**SBS**  
Stimulated Brillouin Scattering

**SC U-LBO**  
SC Universal Line-Build-Out

**SD**  
Signal Degrade

**SDH**  
Synchronous Digital Hierarchy

**SDL**  
Supervisory Data Link

**Section Overhead (SOH)**  
Capacity added to either an AU-4 or assembly of AU-3s to create an STM-1. Contains always STM-1 framing and optionally maintenance and operational functions. SOH can be subdivided in MSOH (multiplex section overhead) and RSOH (regenerator section overhead).

**SEFS**  
Severely Errored Frame Seconds

**SEL**  
NSAP Selector is used to differentiate multiple access points (NSAPs) for the same network element whose network name is the Network Entity Title.

**SES**  
Severely Errored Seconds

**SESP**  
P-bit Severely Errored Seconds

**Severely Errored Frame Seconds (SEFS)**  
A performance-monitoring parameter.

**Severely Errored Seconds (SES)**

This performance monitoring parameter is a second in which a signal failure occurs, or more than a preset amount of coding violations (dependent on the type of signal) occur.

**Severely Errored Seconds - P-bit (SESP)**

A performance-monitoring parameter.

**SF**

Signal Fail

**SID**

System Identifier

**Signal to Noise ratio (SNR)**

The relative strength of signal compared to noise.

**Single Mode Fiber (SMF)**

A fiber that has a core (the glass center of the fiber which light travels through) which is small enough so that only one wave can pass through it. This is the only fiber used for long distance optical communication.

**Single-ended Operations**

The single-ended operations capability provides operations support from a single location to remote network elements (NEs) in the same SONET subnetwork. With this capability you can perform operations, administration, maintenance, and provisioning on a centralized basis. The remote NEs can be those that are specified for the current release.

**Site Address**

The unique address for each regenerator or terminal in a repeater span.

**SNMS**

Subnetwork Management System.

**SNR**

Signal to Noise ratio

**SNR-C**

Signal-to-Noise Ratio-Optical Channel

**SONET**

Synchronous Optical Network

**Span**

An uninterrupted bidirectional fiber section between two network elements. Spans can be measured in distance (Kilometers) or in the amount of loss that exists in the span (dB).

**Span Growth**

A type of growth in which one wavelength is added to all lines before the next wavelength is added.

**Span Loss**

Loss (in dB) of optical power due to the span transmission medium (includes fiber loss and splice losses).

**SPE**

Synchronous Payload Envelope

**SPM**

Self Phase Modulation

**SPR-C**

Signal Power Received - Optical Channel

**SPR-P**

Signal power - Pilot Channel

**SPR-SU**

Signal Power Received - Supervisory

**SPT-C**

Signal Power Transmitted - Optical Channel

**SPT-SU**

Signal power Transmitted - Supervisory

**SSMF**

Standard Single Mode Fiber

**ST**

standard-type connector, 0.3dB typical loss

**STM-n**

Synchronous Transport Module level n

**STS, STS-n**

Synchronous Transport Signal

**STS-1E**

Now referred to as EC-1. A signal typically carried by coaxial cables from one equipment location to another. The term EC-1 refers to the organization and data rate of the signal and also to the voltage template the signal must conform to and the impedances for which the voltage

template is valid.

**STS1E Interface Circuit Pack**

The STS1E Interface circuit pack interfaces with up to three bidirectional STS-1 signals.

**Subnetwork**

A collection of nodes connected by a single transmission medium.

**Subnetwork Management System (SNMS)**

An element management system that supports various WaveStar® OLS 1.6T Network Elements.

**Supervisory Signal**

An optical signal originating with the telemetry circuit pack that is used to communicate maintenance information.

**Suppression**

A process where service-affecting alarms that have been identified as an "effect" are not displayed to a user.

**SUPVY**

Supervisory

**Synchronous**

Network elements that are timed from references traceable to a single Stratum-1 source.

**Synchronous Digital Hierarchy (SDH)**

A family of digital transmission rates from 51.84 Mb/s to 9.953 Gb/s that allows the interconnection of transmission products around the world.

**Synchronous Network**

The synchronization of transmission systems with payloads to a master (network clock that can be traced to a single reference clock).

**Synchronous Optical Network (SONET)**

A family of fiber optic transmission rates from 51.84 Mb/s to 13.22 Gb/s that allows the interworking of transmission products from multiple vendors.

**Synchronous Payload Envelope (SPE)**

A 125-microsecond frame structure composed of STS path overhead and bandwidth for the payload.

**Synchronous Transfer Mode (STM)**

Transport and switching method that depends on information occurring in regular and fixed patterns.

**Synchronous Transport Signal (STS, STS-n)**

The basic logical building block signal with a rate of 51.840 Mb/s for an STS-1 signal and a rate of n times 51.840 Mb/s for an STS-n signal.

**SYSCTL**

System Controller

**SYSMEM**

System Memory

**System Controller (SYSCTL)**

System Controllers are the central processing unit of a system.

**System Identifier (SID)**

Part of NSAP used for intra-Area routing to the destination Node in the destination Area when the Area address part is the address for that Area.

**System Memory (SYSMEM)**

SYSMEM is where the system software is stored.

---

**T T1X1 and T1M1**

The ANSI committees responsible for telecommunications standards.

**TA**

Technical Advisory

**TABS**

Telemetry Asynchronous Byte Serial (Protocol)

**TAP**

Trouble Analysis Procedure

**Target Identifier (TID)**

A provisionable parameter used to identify an FT-2000 *OC-48/STM-16* Lightwave network element. Typically, the TID is the common language location identifier (CLLI<sup>™</sup>) of the FT-2000 1x1 End Terminal, FT-2000 Add/Drop-Rings Terminal, and FT-2000 Repeater Bays.

**TCA**

Threshold-Crossing Alert

**TCP/IP**

Transmission Control Protocol/Internet Protocol

**TDM**

time division multiplexing

**Threshold-Crossing Alert (TCA)**

A condition set when a counter exceeds a user-selected high or low threshold. A TCA does not generate an alarm but is available on demand through the CIT.

**THz**

Terrahertz ( $10^{12}$  Hz)

**TID**

Target Identifier

**Time Division Multiplexing (TDM)**

The process of combining a number of lower speed lines into a higher speed line by allocating a short piece of time to each signal.

**TL1**

Transaction Language 1

**TOD**

Time of Day

**TOP**

Task Oriented Procedure

**TOPR-OL**

Total Power Received - Optical Line

**TOPT-OL**

Total Power Transmitted - Optical Line

**Transaction Language 1 (TL1)**

A machine-to-machine communications language that is a subset of CCITT's human-machine language.

**Transmission Control Protocol/Internet Protocol (TCP/IP)**

A networking protocol that provides communication across interconnected networks between computers with diverse hardware architectures and various operating systems.

**Transport Service Bridge (TSB)**

Used internally by an NE to provide direct connectivity with the SNMS via the TCP/IP network to exchange network operation and management information. OLS 400G supports an internal RFC 100g TSB function between OS(s) and NEs for customers that wish to use a TCP/IP network for transporting OSI application messages.



**TrueWave® Fiber**

Non-zero dispersion-shifted fiber manufactured by Lucent Technologies (previously referred to as DEB fiber).

**TSB**

Transport Service Bridge

**TTL**

transistor logic

**Tx**

Transmit

---

**U UAS**

Unavailable Seconds

**UBob**

universal build out block

**Unavailable Seconds (UAS)**

In performance monitoring, the count of seconds in which a signal is declared failed or in which 10 consecutively severely errored seconds (SES) occurred, until the time when 10 consecutive non-SES occur.

**Upgrade**

An upgrade is the addition of new capabilities (features). This requires new software and may require new hardware.

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**V Value**

A number, text string, or other menu selection associated with a parameter.

**VOA**

Variable Optical Attenuator

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**W WAD**

Wavelength Add/Drop

**Wave Division Multiplexing (WDM)**

WDM merges optical traffic onto one common fiber. It allows high flexibility in expanding bandwidth. It reduces costly mux/demux function, and reuses existing optical signals.

**Wavelength**

A wavelength is the length of a single wave (measured from crest to crest or trough to trough, for example) or the distance a wave travels in the time it takes to complete one cycle.

Wavelengths are usually expressed in micrometers (mm) or nanometers (nm). Wavelength is often abbreviated by the Greek symbol lamda ( $\lambda$ ).

**Wavelength Add/Drop (WAD)**

The process of adding and dropping wavelengths to provide more efficient transmission. For example, a central office contains two or more OLS end terminals, some wavelengths can be added and dropped locally while others go express between the end terminals by means of OTs.

**Wavelength Blocking**

At a WA/D site with branching, if a wavelength goes express between two co-located OLS end terminals, that wavelength can only be added or dropped at the third co-located end terminal. Wavelength interchange permits the wavelength on the third end terminal to be converted into an available wavelength at the other two end terminals.

**Wavelength Growth**

A type of growth in which all eight wavelengths are added to a single line before more lines are added.

**Waves**

A wave is an oscillation or movement that transfers energy from point to point. Mathematically, it is described in terms of its frequency, amplitude, and velocity; and it can be visualized as a moving swell or succession of curves.

**WaveWrapper**

The Lucent proprietary format of transporting optical channels. The WaveWrapper format raises the bit rate by factor of 15/14 and adds optical channel overhead and FEC check bytes.

**Wideband Communications**

Voice, data, and/or video communications at digital rates from DS0 to DS1 rates (64Kb/s to 1544Kb/s)

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**X XPM**

Cross Phase Modulation (same as CPM)

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**Z ZDW**

Zero dispersion wavelength

**Zero Code Suppression**

A technique used to reduce the number of consecutive zeros in a line-codes signal (B3ZS for DS3 signals).

**Zero Dispersion Shifted Fiber (DSF)**

DSF where the zero dispersion point is shifted from 1310nm to 1550 nm. It is best suited for applications involving single channel transmission at 1550 nm, providing the benefits of zero dispersion as well as taking advantage of the lower attenuation wavelength.





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