Lucent Technologies
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WaveStar® TDM 2.5G(OC-48)/ 10G(OC-192) (2-Fiber) Release 6

Alarm Messages and Trouble-Clearing Guide

365-371-211 R6
CC109151704
Issue 6
September 2001

Lucent Technologies
Bell Labs Innovations

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The terms and conditions of sale will include a 1-year warranty on hardware and applicable software.

Support Telephone Number

For SONET technical assistance, call 1-800-225-RTAC. The Lucent Technologies North American Regional Technical Assistance Center (RTAC) provides a technical assistance telephone number that is monitored 24 hours a day.

For SDH technical assistance, call Technical Support Services (TSS) at +1-630-224-4672: Prompt 2.

You can also call these telephone numbers to provide comments on WaveStar® TDM 2.5G(OC-48)/10G(OC-192) (2-Fiber) or to suggest enhancements.

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Document Title: ***WaveStar TDM 2.5G (OC-48)/10G (OC-192) (2-Fiber), Release 6***
Alarm Messages and Trouble-Clearing Guide

Document Number: *365-371-211* *Issue 6,* Publication Date: *September 2001*

Please check the ways you feel we could improve this document:

- ❑ Improve the preface
- ❑ Improve the table of contents
- ❑ Improve the organization
- ❑ Improve the index
- ❑ Include more figures
- ❑ Add more examples
- ❑ Make it more concise / brief
- ❑ Simplify the ordering information
- ❑ Add more detail
- ❑ Make it less technical
- ❑ Add more / better quick reference aids
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Please provide details for the suggested improvement.

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Please tell us what aspects of this document are most helpful or appealing to you or write any other comments below:

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Contents

About this information product

Purpose

This document provides the following information about the WaveStar® TDM 2.5G/10G system:

- Detailed descriptive information about alarm messages
- Maintenance and trouble clearing descriptive information
- Trouble clearing tasks.

The WaveStar TDM 2.5G/10G (2-Fiber) system has a phased product release plan. This alarm messages and trouble clearing guide covers all product releases up to Release 6. For more information about the WaveStar TDM 2.5G/10G (2-Fiber) product releases and a complete list of features, refer to 365-371-201, WaveStar TDM 2.5G/10G (2-Fiber) *Release 5.0 Applications and Planning Guide*

Reason for reissue

This document, Issue 6, replaces the *WaveStar TDM 2.5G/10G, Release 5, Alarm Messages and Trouble Clearing Guide, Issue 5*. This document is reissued to update existing information and provide alarm message and trouble clearing information about Release 6 features.

Safety labels

For more information please read Appendix A, Safety. The following safety labels are used through this document:

DANGER

Indicates the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.

WARNING

Indicates the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.

CAUTION

Indicates 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, including equipment damage, loss of software, or service interruption.

Intended audience

This document is primarily for operating and maintaining the WaveStar TDM 2.5G/10G (2-Fiber) system. It may be used by anyone desiring specific alarm message and trouble clearing information.

How to use this information product

The following table briefly describes the type of information in each chapter.

Chapter	Title	Description
	About This Document	Describes the purpose of the document, the intended audience, organization of the document, references related documentation, and explains how to comment on this document.
1	Alarm Messages	Describes the alarm messages generated by the system.
2	Maintenance and Trouble Clearing	Defines the maintenance philosophy and outlines the various features available to monitor and maintain the WaveStar TDM 2.5G/10G (2-Fiber) system.
Part III	Trouble Clearing Tasks	Provides procedures for clearing conditions that cause alarms.
Part IV	Supporting Tasks	Provides procedures that support trouble clearing tasks.
A	Safety	Provides important safety information.
	Abbreviations and Acronyms	Explains common telecommunication abbreviations and acronyms.
	Glossary	Defines telecommunication terms.
	Index	Lists specific subjects and their corresponding page numbers.

How to use the task parts

The following information explains how to use the task parts of this document

> **Important!** For your convenience, The WaveStar BandWidth Manager and WaveStar WaveStar TDM 2.5G/10G (2-Fiber) User Operations Guide maintain consistent task numbers for a given task. If a task does not apply to a certain product, it is purposely omitted from the User Operations Guide.

How to find instructions

To find the instructions for performing tasks, proceed as follows:

1. Find your job in the appropriate task index (for example, trouble clearing) and go to the referenced task; for example, **Clear Circuit Pack Failure**.
2. Tasks contained in the trouble clearing task index are classified as *task element*. Task elements contain step-by-step instructions to accomplish a distinct user task. All task elements are listed in numerical order but are not used in numerical order.
3. Perform all steps in the task element in the suggested order unless it sends you to another task element or a *supporting element.* Supporting elements contain details necessary to complete the step it supports on the task. Supporting elements allow new or infrequent users access to detailed information not needed by experienced users. After you have completed a task element, you have finished the task.
4. **IMPORTANT:** When you complete a supporting element, you MUST return to the task element that sent you there.
5. **IMPORTANT:** Unless otherwise instructed, if one task element sends you to another task element, you should return to the first task element after you complete the second
6. Sometimes you will be asked to verify that actions have occurred. This may take the form of a formal statement of the expected response. At other times, the instructions will merely state ***verify that.*** If the expected response is not observed and a specific trouble-clearing reference is not made, refer to the *Trouble Clearing Task Index* to start trouble clearing.
7. If you need help in clearing a trouble after completing all the applicable trouble-clearing procedures, contact your local or regional maintenance assistance group. Then, the group may contact the Lucent Technologies Regional Local Support at **1-866-LUCENT8 (582-3688): Prompt 1** in accordance with local procedures.

Faulty equipment return

Faulty equipment should be returned to the following address for repair:

Lucent Technologies Network Systems
Returned Goods Department
Dept. 11MV287122
1600 Osgood Street
North Andover, MA 018454

Conventions used

The tasks in this manual use a **MONOSPACE** font to identify text on a screen or a response displayed from the network. A **BOLD** font identifies the lettering designations on panels, shelves, and circuit packs.

Task numbering

Each group of tasks is numbered according to task category. The numbering system indicates only the group to which a task belongs. A task number does not express the priority of tasks, the privilege required for tasks, or the sequence in which tasks should be performed.

The task numbering conventions for the respective task groups are as follows:

- Trouble clearing(500-599)
- Supporting (700-799).

For example, a task numbered 502 is a Trouble Clearing task. A task numbered 706 is a supporting task.

WaveStar TDM 2.5G/10G documentation set

The Lucent Technologies documents listed in this section provide additional information about the WaveStar TDM 2.5G/10G (2-Fiber) system.

Document list

The following table list the documents included in the WaveStar TDM 2.5G/10G documentation set.

Document Number	Title
365-371-201 CC109151720	*WaveStar TDM 2.5G/10G* *Applications and Planning Guide*
365-371-210 CC109151746	*WaveStar TDM 2.5G/10G* *User Operations Guide*
365-371-211 CC109151704	*WaveStar TDM 2.5G/10G* *Alarm Messages and Trouble Clearing Guide*
365-371-206 CC109151738	*WaveStar TDM 2.5G/10G* *Installation Manual and Turn-up Services*
365-371-207 CC109151696	*WaveStar TDM 2.5G/10G* *Operations Systems Engineering Guide*

Description of documentation set

This section briefly describes the documents that are included in the WaveStar TDM 2.5G/10G (2-Fiber) documentation set.

Installation manual

The *WaveStar TDM 2.5G/10G (2-Fiber) Installation Manual and Turn-Up Services* is a step-by-step guide to system installation and setup. It also includes information needed for pre-installation site planning and post-installation acceptance testing

Applications and planning guide

The *WaveStar TDM 2.5G/10G (2-Fiber) Applications and Planning Guide (APG)* is for use by network planners, analysts and managers. It is also for use by the Lucent Account Team. It presents a detailed overview of the system, describes its applications, gives planning requirements, engineering rules, ordering information, and technical specifications.

User operations guide

The *WaveStar TDM 2.5G/10G (2-Fiber) User Operations Guide* provides step-by-step information for use in daily system operations. The manual demonstrates how to perform system provisioning, operation, and administrative tasks.

Alarm messages and trouble clearing guide

The *WaveStar TDM 2.5G/10G (2-Fiber) Alarm Messages and Trouble Clearing Guide* provides detailed information on maintenance and trouble clearing, a list of the systems's alarm messages, and procedures for routine maintenance, troubleshooting, diagnostics, and component replacement.

Operations systems engineering guide

The *WaveStar TDM 2.5G/10G (2-Fiber) Operations Systems Engineering Guide* provides detailed information on TL1 commands, messages, and error codes.

Available drawings

The following table list drawings available from the Customer Information Center (CIC). These drawings provide valuable product information.

Drawing number	Title
ED8C789-10	*Typical Bay Arrangement, Ordering Information, Cabling and Floor Plan Data Sheets*
ED8C789-30	*WaveStar TDM 2.5G Shelf Assembly*
ED8C789-31	*WaveStar TDM 10G Shelf Assembly*
ED8C789-32	*WaveStar TDM 2.5G/10G (2-Fiber) Circuit Pack Ordering*
ED8C789-33	*WaveStar TDM 2.5G/10G (2-Fiber) Bay Closing Details*
ED9C280-31	*DS3 Connector Panel (External Mount)*
ED8C789-34	*DS3 Kit [DS3 Connector Panel (Internal Mount and Rear Mount)]*
ED8C789-35	*WaveStar TDM 2.5G/ 10G (2-Fiber) Bay*
365-371-202	*Software Ordering Guide (Release 4 and later)*

Technical support services

This part describes the technical support services available for the WaveStar TDM 2.5G/10G (2-Fiber) system.

Technical Support Services Groups

Technical support services are available through the following:

- Regional Local Support
- Product Support for Optical Networking Products

Lucent Technologies technical support services groups are committed to providing customers with high quality product support services. The technical support services organizations regard customers as their highest priority and understand customers' obligation to maintain quality services.

Contacting Regional Local Support

Lucent Technologies Regional Local Support is the first point of contact for technical support services. Regional Local Support personnel troubleshoot field problems 24 hours a day over the phone and on site (if necessary).

For technical assistance, call **1-866-LUCENT8** (**582-3688): Prompt 1**.

> **Important!** International customers, please contact your Account Executive for your local technical support services number.

Regional Local Support Services

Regional local support personnel provides the following technical support services:

- Tracks and maintains visible ownership of all reported customer assistance requests, from inception through resolution
- Analyzes and diagnoses reported problems
- Communicates actions, plans, and problem status to the reporting customer
- Provides restoration and recovery services
- Provides preventative and/or circumvention measures
- Initiates action to establish modifications requests (MRs) for design issues
- Writes technical bulletins
- Provides technical assistance to installers

Regional Local Support personnel are supported by Lucent Technologies Product Support for Optical Networking Products.

Product Support for Optical Networking Products

The Product Support for Optical Networking Products organization provides quality product support services and regards the customer as its highest priority. The Product Support for Optical Networking Products organization maintains direct contact with development and manufacturing organizations of Lucent Technologies to assure prompt resolution of all customer assistance requests.

The Product Support for Optical Networking Products organization provides the following technical support services:

- Manages customer assistance requests
- Supports first service applications, customer lab evaluations, and initial customer applications
- Develops software release descriptions, installation manuals, engineering change procedures (ECPs), method of procedures (MOPS), modification implementation procedures (MIPs)
- Provides installation and Local Regional training

A technical support platform

The Product Support for Optical Networking Products organization provides an online system, the Customer Assistance Request Entry System (CARES), to track all customer assistance requests. The CARES system communicates details about assistance requests, product bulletins, and other critical information to customer sites. The CARES web site is available at http://www.lucent.com/support/. To obtain a login, please call 1-866-236-4448.

Training

The Lucent Learning Services organization offers a formal training package to complement your product needs. On-site training is available for all WaveStar TDM 2.5G/10G training courses.

To enroll in a training class at one of Lucent's corporate training centers or to arrange an on-site training session at your facility, please call *1-888-LUCENT8 (582-3688): Prompt 2*.

TR9203 Synchronous Optical Network (SONET) Overview

Content:
This course provides personnel with a basic description of the SONET standard and addresses the following key points:

- SONET-- its evolution and advantages
- Layers
- Format, rates, and mappings
- Overhead
- Pointers and dynamic alignment
- Virtual tributaries
- STS multiplexing
- Automatic protection switching

- Maintenance signals
- Network elements

Audience:
Telecommunications professionals, engineers, project managers, account executives, and other sales personnel who need to understand the Synchronous Optical Network.

Course Length: 1 day

LW2262 WaveStar TDM 2.5G/10G (2-Fiber) Applications, Architecture, and Planning Course

Content:
The WaveStar TDM 2.5G/10G (2-Fiber) Applications, Architecture, and Planning Course (LW2262) provides a detailed introduction to WaveStar TDM 2.5G/10G (2-Fiber), covering the features and benefits of the network solutions, equipment functions and requirements, and network planning.

Audience:
Network planners and engineers, and Lucent marketing/sales personnel, product managers, technical consultants, and account representatives.

Course Length: 2 days

LW2661 WaveStar TDM 2.5G/10G (2-Fiber) Operations and Maintenance Course

Content:
The WaveStar TDM 2.5G/10G (2-Fiber) Operations and Maintenance Course enables technicians to properly operate and maintain a WaveStar TDM 2.5G/10G (2-Fiber). The course covers the physical equipment and the new graphical user interface (GUI)-based WaveStar Craft Interface Terminal (CIT) that is used to provision equipment, make cross-connections, perform administrative functions, and do manual protection switching. This course is based on the WaveStar TDM 2.5G/10G (2-Fiber) User Operations Guide (UOG), and Alarm Messages and Trouble Clearing Guide (AMTCG).

Audience:
Technicians responsible for the operations and maintenance of the equipment. This course will also be helpful to technical support personnel and anyone needing working knowledge of the equipment.

Course Length: 4 days

How to comment

Because customer satisfaction is extremely important to Lucent Technologies, every attempt is made to encourage feedback from customers about our information products.

Customer comment form

A customer comment form is located immediately after the title page of this document. Please fill out the form and fax it to the number provided on the form.

If the customer comment form is missing, send or fax comments about this information product to:

Lucent Technologies
Lucent Learning Services (formerly Customer Training and
Information Products
Building 21, Room 3A-06
1600 Osgood Street
North Andover, MA 01845

Fax: 1-978-960-6835

How to order

This section describes how to order documentation, drawings, and electronic documentation (CD-ROMS).

To order documents, specify the document or CD-ROM that you need and the information for commercial customers to order documentation and drawings or request placement on the standing order list (for reissues of any document). You can order by mail, internet, telephone, or fax.

Lucent Technologies Inc
Customer Information Center
Attention: Order Entry Section
2855 N. Franklin Road
P.O. Box 19901
Indianapolis, IN 46219

Internet Address:
www.lucentdocs.com

Telephone/Fax Number

From U.S.A:
Telephone: 1-888Lucent-8
(1-888-582-3688)
Fax: 1-800-566-9568

From North American Region (NAR)
Telephone: 1-317-322-6619
Fax: 1-317-322-6359

From Asia/Pacific Region and China; Caribbean/Latin America Region (CALA)
Telephone: 1-317-322-6411
Fax: 1-317-322-6699

From Europe/Middle East/Africa (EMEA)
Telephone: 1-317-322-6416
Fax: 1-317-322-6699

RBOC/BOC customers should process orders through their company documentation coordinator.

Documentation for WaveStar TDM 2.5G/10G is available on CD-ROM. If you wish to order an annual subscription, obtain pricing information, or obtain a list of documents available on CD-ROM, contact your account executive or Lucent Technologies Customer Information Center.

One of the following methods of payment is required from commercial customers: Check (payable to Lucent Technologies), money order (payable to Lucent Technologies, purchase order number, or charge number.

Lucent Technologies entities should use Form IND 1-80.80 FA, which is available through the Customer Information Center.

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1 Alarms, Conditions, and Error Messages

Overview

Purpose

This overview serves to describe the format and content of an Alarm Message as well as the organization and presentation of the various types of Alarm Messages.

Format of alarm messages

Each alarm message is described by an individual table with the following information items:

Alarm Data	What It Means
Probable Cause	This is the same “Probable Cause” as contained in the Alarm List report – which is visible from the WaveStar CIT *System View* screen. This field lists the acronym (as it appears in the *Probable Cause* column) and it’s expansion (as it appears in the *Description* column).
Definition	Two to three sentences or a paragraph that describes this alarm.
Nature of Alarm/Type	*Nature of Alarm* serves to indicate whether the alarm is: 1. Temporary/Transient — meaning that it appears for a brief time interval until cleared by the system (without external intervention), or 2. Persistent — meaning that it appears and remains (continuously) until cleared by the system or external intervention. Persistent give the following two types of notifications: - when it occurs, and - when it clears. *Type*, which is synonymous with the WaveStar CIT Alarm List column header *Alarm Type*, serves to indicate one of six different alarm notification categories. They are:

Alarm Data	What It Means
Nature of Alarm/Type *Continued*	• Communications – meaning that the identified probable cause (alarm) was generated by one or more of following interface standards (SONET - including EC1, SDH - including STM1E, or T3). Or, one or more of the following system anomalies (system timing/timing reference failure, protection switching protocol/switching failure). The exact type, or types, is listed with the *Interface Standard/ Possible Signal Level Affected*. • Equipment – meaning that the identified probable cause (alarm) was generated internal to this node and not on one of the external communication interfaces. • Processing Error – meaning that the identified probable cause (alarm) was generated as the result of an abnormal activity with the system's software. • Quality-of-Service – meaning that the identified probable cause (alarm) was generated as the result of bit-error rates that have exceeded a predetermined threshold. These are also referred to as TCA alarms. • Environmental – this category includes the external alarm sensors, which are referred to as miscellaneous discretes. • Security – meaning that the identified probable cause (alarm) was generated as the result of an excessive number of failed login attempts.
Type AID Affected	Indicates, by functional category (for example, shelf, circuit pack, port, logical tributary, and so forth) the type of AID that is affected by this alarm.
Interface Standard	Indicates whether the alarm is available only on SONET signals, SDH signals, or T3 signals.
Possible Signal Level Affected	The different optical and/or electrical signals that this alarm may have an association.
Effect on Service	This is the same "Effect on Service" as contained in the Alarm List report – which is visible from the WaveStar CIT *System View* screen.The two "Effect on Service" options are: Non-Service Affecting (NSA), and Service Affecting (SA).

Alarm Level	This is the same "Alarm Level" as contained in the Alarm List report – which is visible from the WaveStar CIT *System View* screen. For each Probable Cause there is an associated *Alarm Level*. Possible values are: • Critical (CR) • Major (MJ) • Minor (MN) • Not Alarmed • Not applicable, and • Not Reported (NR).
On-site Indications	User Panel LEDs – These are the visual indicators that are generated by the node whenever this *Probable Cause* is raised. Possible choices are: • CR LED • MJ LED • MN LED, and • NO User Panel LEDs illuminated. Circuit Pack Faceplate – These are the visual indicators that are generated by the node whenever this *Probable Cause* is raised. Possible choices are: • Continuous Red LED • Flashing Red LED • Flashing Green LED • NO Indication (no alarm indication – which is a continuous Green LED).

On-site Indications, *Continued*	Not Reported, for example an AIS, means that the alarms will only appear on the CIT. There will not be any indications on the User Panel or circuit pack faceplate LEDs. Furthermore, Not Reported alarm levels will not appear on the CIT's Alarm List. Other menus must be used to determine the condition type. For example, to display an AIS use `Fault-Analysis-Facility Failure States` and expand down the directory structure to the port/tributary level.
Can the Default Alarm Level be Re-provisioned via ASAP?	Note: The alarm level reported depends on the ASAP. In this document the default ASAP is used. *YES*, the Alarm Severity Assignment Profile (ASAP) can be used to change the alarm level. or *NO*, ASAP cannot be used to change the alarm level.
Trouble-Clearing Task ID	A specific 4-character identifier (for example, T 500) that contains the numbered steps, which are referred to as a procedure, for clearing this alarm. Alarms which are transient in nature and that do not require any external human intervention to clear – will not have a 4-character identifier (procedure) specified.

Contents This chapter provides the following information

Alarm Messages

Order of presentation

Alarm Messages are grouped by alarm type and listed alphabetically by Probable Cause. The order of presentation is as follows:

- First, Communications
- Second, Equipment
- Third, Processing Error
- Fourth, Quality-of-Service
- Fifth, Environmental
- Sixth, Security

Required login permissions

Any user who's login permissions include an M1 or higher can view (display) the Alarm List. However, any user who's job functions include performing Trouble-Clearing tasks are required to have an M4 or an M5. Refer to heading *NE Login Administration*, in the WaveStar TDM 10G User/Operations Guide, for further details.

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Alarm Messages - Communications

AIS (Alarm Indication Signal - DS3)

Alarm Data	**What it Means**	
Probable Cause	AIS (Alarm Indication Signal – DS3)	
Definition	Alarm indication signals that notify downstream equipment that a failure has been detected and alarmed by some upstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	MN
On-site Indications - User Panel LED	CR	MN
- Circuit Pack faceplate	flashing Red	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *DS3 port Incoming* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable (Trouble-Clearing actions should be performed on the receive (IN) port at the upstream node).	

AIS-L (Alarm Indication Signal – Line)

Alarm Data	What It Means	
Probable Cause	AIS-L (Alarm Indication Signal – Line)	
Definition	Alarm indication signals that notify downstream equipment that a failure has been detected and alarmed by some upstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	NR (Not Reported)	NR (Not Reported)
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OCn/EC1* port can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable (Trouble-Clearing actions should be performed beginning at the upstream node).	

ANM (Ethernet Port – Auto Negotiation Mismatch)

Alarm Data	What it Means	
Probable Cause	ANM (Ethernet Port – Auto Negotiation Mismatch)	
Definition	The GE1/SX2 interface supports the exchange of remote fault information. Whenever “Priority Resolution” precludes normal operation – the Auto Negotiation Mismatch (ANM) alarm shall be raised.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	LAN Port	
Interface Standard	Possible Signal Level Affected	
- 1 Gigabit Ethernet	1GE	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	MJ	(NR) Not Reported
On-site Indications - User Panel LEDs	MJ	NR
- Circuit Pack faceplate LED	Flashing Red	
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *Ethernet* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

APSC (BLSR Inconsistent APS Codes)

Alarm Data	**What It Means**	
Probable Cause	APSC (BLSR Inconsistent APS Codes)	
Definition	For K-bytes to be considered consistent, in the first 12 frames since the K-bytes were found to be consistent, there must be 3 consecutive frames which have identical K-bytes. In other words, there is a rolling window of 12 frames in which 3 consecutive frames must have identical K-bytes. If this condition is violated, the INAPS Alarm will be raised.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group side	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 524	

APSFOP (APS Failure of Protocol)

Alarm Data	What It Means	
Probable Cause	APSFOP (APS Failure of Protocol)	
Definition	There are two modes of APS. They are referred to as: • With K-bytes, and • Without K-bytes. For the mode, *With K-bytes*, this alarm indicates that the receiver could not decode meaningful information from the K-byte. For the mode, *Without K-bytes*, this alarm indicates that the receiver is detecting a Signal Degrade or Signal Failure Condition.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	(1+1 Protection Group) OC192, OC48, OC12, OC3	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *automatic protection switching* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable (Trouble-Clearing actions should be performed beginning at the upstream node).	

APSPROV (BLSR Improper APS Codes)

Alarm Data	**What It Means**	
Probable Cause	APSPROV (BLSR Improper APS Codes)	
Definition	A BLSR or MS-SPRing ring is detecting K-bytes with an invalid status.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group side	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 525	

BLSR-DKB (BLSR Default K-bytes)

Alarm Data	**What It Means**	
Probable Cause	BLSRDKB (Default K-bytes)	
Definition	Default K-bytes were received; the received K-byte Source Node ID is the same as the Destination Node ID.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group side	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 526	

CBITMM (C-bit Mismatch)

Alarm Data	What It Means	
Probable Cause	CBITMM (C-bit Mismatch)	
Definition	The DS3 port is provisioned for *C-bit Parity;* but, the port is receiving a signal with some other DS3 signal format.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	MN
On-site Indications - User Panel LEDs		
- Circuit Pack Faceplate LED		
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *DS3 Port Incoming* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 576	

CFOPR (VCG Failure of Protocol Rx)

Alarm Data	**What It Means**	
Probable Cause	CFOPR (VCG Failure of Protocol Receive)	
Definition		
Nature of Alarm/Type	Persistent	Communications
Type AID Affected		
Interface Standard	Possible Signal Level Affected	
- SONET		
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	NR
On-site Indications - User Panel LEDs		
- Circuit Pack Faceplate LED		
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

CFOPT (VCG Failure of Protocol Tx)

Alarm Data	**What It Means**	
Probable Cause	CFOPR (VCG Failure of Protocol Transmit)	
Definition		
Nature of Alarm/Type	Persistent	Communications
Type AID Affected		
Interface Standard	Possible Signal Level Affected	
- SONET		
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	NR
On-site Indications - User Panel LEDs		
- Circuit Pack Faceplate LED		
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

CLOPC (VCG Loss of Partial Capacity)

Alarm Data	What it Means	
Probable Cause	CLOPC (VCG Loss of Partial Capacity)	
Definition		
Nature of Alarm/Type	Transient	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	Not Applicable
- SDH Alarm Level	Not Allowed	Not Applicable
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR/MS-SPRing Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. No user action required.	

CLOTC (VCG Loss of Total Capacity)

Alarm Data	What it Means	
Probable Cause	CLOTC (VCG Loss of Total Capacity)	
Definition		
Nature of Alarm/Type	Transient	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	Not Applicable
- SDH Alarm Level	Not Allowed	Not Applicable
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR/MS-SPRing Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. No user action required.	

CPUNAV (Circuit Pack Unavailable)

Alarm Data	What it Means	
Probable Cause	CPUNAV (Circuit Pack Unavailable)	
Definition		
Nature of Alarm/Type	Transient	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	Not Applicable
- SDH Alarm Level	Not Allowed	Not Applicable
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR/MS-SPRing Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. No user action required.	

DCCLD (DCC Line Disabled-Unavailable)

Alarm Data	**What it Means**	
Probable Cause	DCCLD (DCC Line Disabled-Unavailable)	
Definition		
Nature of Alarm/Type	Transient	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	NR	MN
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR/MS-SPRing Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

DCCSD (DCC Sect Disabled-Unavailable)

Alarm Data	What it Means	
Probable Cause	DCCSD (DCC Sect Disabled-Unavailable)	
Definition		
Nature of Alarm/Type	Transient	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	NR	MN
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR/MS-SPRing Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

DCCTO
(DCC Tunnel Overflow)

Alarm Data	What it Means	
Probable Cause	DCCTO (DCC Tunnel Overflow)	
Definition	An automatically calculated IP route could not be stored in the routing table, because the maximum capacity of the routing table is exceeded.	
Nature of Alarm/Type	Transient	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	NR	MN
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR/MS-SPRing Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Free-up storage capacity of the routing table by de-provisioning (removing) dispensable entries.	

DUPL-RNG (Duplicate Ring Node)

Alarm Data	What It Means	
Probable Cause	DUPL-RNG (Duplicate Ring Node)	
Definition	Two nodes exist in a ring with either the same TID, system field ID in the NSAP, or there are more than 16 nodes in the ring.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 529	

EOC (DCC Sect Disabled-Unavailable)

Alarm Data	What it Means	
Probable Cause	EOC (DCC Sect Disabled-Unavailable)	
Definition	For BLSR DCCs provisioned to use section overhead provisioning activity has occurred which required allocation of LAPD channels and no channels were available in the working DCC circuit pack. Examples of such provisioning activity are: • A new optical port (pre)provisioning • A protection group is deleted and LAPD channels must be allocated for what was the standby DCC channels in the protection group.	
Nature of Alarm/Type	Transient	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack LEDs	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Events* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 517	

EOC (DCC Sect Failure)

Alarm Data	What It Means	
Probable Cause	EOC (DCC Sect Failure)	
Definition	The DCC channel has failed due to either: • DCC hardware/equipment failure, or • Failure of the transmission facility carrying the active DCC channel.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications - User Panel LEDs	MN	MN
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OC-n/EC1 Port* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 514	

EOC (DCC Type Mismatch)

Alarm Data	**What it Means**	
Probable Cause	(DCC Type Mismatch)	
Definition	In 1+1 and 1x1 protection groups, if the DCC is protected and the LAPD Roles are not the same or the DCC type (section versus line) is not the same, this alarm will be raised.	
Nature of Alarm/Type	Persistent	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
- SDH	STM64, STM16, STM4, STM1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	Not Alarmed
- SDH Alarm Level	Not Allowed	Not Alarmed
On-site Indications	No indication	No indication
	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *System Events* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

EOC (LinkID Sect Mismatch)

Alarm Data	What It Means	
Probable Cause	EOC (LinkID Sect Mismatch)	
Definition	Upon establishment of a DCC link with another node, the received LinkID has a LinkID protocol version number which is not supported by this nodes LinkID software. Note: The condition will clear only when a LinkID protocol version number is received which is supported.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications - User Panel LEDs	MN	MN
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OCn/EC1 Port* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

EOC (User-Network Side Sect Failure)

Alarm Data	**What It Means**	
Probable Cause	EOC (User-Network Side Sect Failure)	
Definition	This is for BLSR. Both sides of the LAPD channel have been provisioned as user side or network side. This is a provisioning error.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MN
On-site Indications - User Panel LEDs	Not Applicable	MN
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OC-N/EC1 Port* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 516	

FAILTOSW

Alarm Data	What It Means	
Probable Cause	FAILTOSW (Path Switch Failure)	
Definition		
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group AID	
Interface Standard	Possible Signal Level Affected	
- SONET		
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Reported	NA
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type DRIPATH can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

GFPLOF (VCG – Loss of Frame Delineation)

Alarm Data	**What it Means**	
Probable Cause	GFPLOF (VCG – Loss of Frame Delineation)	
Definition	The GE1/SX2 receiver, where this alarm is active, is detecting an Out-Of-Frame (OOF) condition on the signal that is being received from the upstream router.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	VCG	
Interface Standard	Possible Signal Level Affected	
- 1Gigabit Ethernet	VCG	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- VCG	CR	(NR) Not Reported
On-site Indications - User Panel LEDs	CR	NR
- Circuit Pack faceplate LED	flashing Red	NO Indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *Ethernet* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

HLDOVRSYNC (System Clock Holdover)

Alarm Data	What It Means	
Probable Cause	HLDOVRSYNC (System Clock Holdover)	
Definition	Loss of the external reference signal has resulted in either a manual or automatic switch to internal synchronization.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	System	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not applicable	MN
On-site Indications - User Panel LEDs	NO Indication	MN
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Timing* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 519	

ISD
(DS3 Idle Signal)

Alarm Data	What it Means	
Probable Cause	ISD (DS3 Idle Signal)	
Definition	The receiver port is detecting DS3 idle (Blue Signal) from upstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *DS3 Port Incoming* can be used to change the alarm level.	
Trouble-Clearing Task ID	No user action required at the local (detecting NE). However, appropriate personnel at the upstream NE should be notified of this alarm - so that they can trouble shoot and take appropriate action.	

LOA (VCG – Loss of Alignment)

Alarm Data	**What it Means**	
Probable Cause	LOA (VCG – Loss of Alignment)	
Definition	Each concatenated signal has a single LOA defect detector. If the alignment process cannot buffer and properly align the individual STS-Ns to a common multi-frame start – then this alarm is raised.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	VCG	
Interface Standard	Possible Signal Level Affected	
- 1Gigabit Ethernet	1GE	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	(NR) Not Reported
On-site Indications - User Panel LEDs	CR	NR
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *Ethernet* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

LOF
(DS3 Loss of Frame)

Alarm Data	What it Means	
Probable Cause	LOF (DS3 Loss of Frame)	
Definition	The receive port is detecting DS3 loss of frame. DS3 AIS will be inserted towards downstream equipment to indicate trouble is alarmed there.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *DS3 Port Incoming* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 545	

LOF (Loss of Frame)

Alarm Data	What It Means	
Probable Cause	LOF (Loss of Frame)	
Definition	The node’s receiver, where this alarm is active, is not detecting a valid signal frame. The node’s transmitter, where the LOF is active, transmits an AIS-(L or P) toward the upstream receiver.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OCn/EC1 port* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 545	

LOM (VCG – Loss of Multi-frame)

Alarm Data	What it Means	
Probable Cause	LOM (VCG – Loss of Multi-frame)	
Definition	Each VC-n has it's own LOM detection process. The LOM alarm shall be declared whenever the LOM's two algorithms remain in the Out-of-Multi-frame state for 5 milliseconds.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	VCG	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	(NR) Not Reported
On-site Indications - User Panel LEDs	CR	NR
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *STS-N Path Terminated SONET* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

LOP-P (Loss of Pointer – Path)

Alarm Data	**What it Means**	
Probable Cause	LOP-P (Loss of Pointer – Path)	
Definition	A valid pointer was not found in N consecutive frames (where 8 <= N <= 10), or N consecutive *new data flags* (other than in a concatenation indicator) were detected.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *STS-N(c) Point-to-Point Tributary* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

LOS (DS3 Loss of Signal)

Alarm Data	What it Means	
Probable Cause	LOS (DS3 Loss of Signal)	
Definition	The receive port is detecting DS3 loss of signal. DS3 AIS will be inserted towards downstream equipment to indicate trouble is alarmed here.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *DS3 Port Incoming* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 543	

LOS
(Loss of Signal)

Alarm Data	What It Means	
Probable Cause	LOS (Loss of Signal)	
Definition	The node's receiver, where this alarm is active, is not detecting a valid signal level. If the alarm is a CR, the system will insert a logical all-1's signal toward the downstream equipment. If the alarm is MN, the signal was protected.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1, 1GE	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR (not protected)	MN (protected), or NR (for 1GE)
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OCn/EC1 port* can be used to change the alarm level. YES, ASAP type *Ethernet* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 543	

MAN (Constituent Signal Rate Change)

Alarm Data	What it Means	
Probable Cause	MAN (Constituent Signal Rate Change)	
Definition	Indication that the incoming signal tributary structure has changed.	
Nature of Alarm/Type	Temporary	Communications
Alarm Type/ Condition Type	STS3 Cross Connect, or STS12 Cross Connect, or STS48 Cross Connect	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- System Event	Not Allowed	Not Alarmed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *System Event* can be used to change the alarm level.	
Trouble-Clearing Task ID	No user action required.	

NID-CONFL

Alarm Data	What It Means	
Probable Cause	NID-CONFL (Node ID Mismatch)	
Definition	In a BLSR, the Source Node ID in the received K-bytes is not a valid Node ID in the ring map or the Source Node ID is not a valid neighbor of this Node.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	BLSR	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

NUTDSBLD

Alarm Data	What It Means	
Probable Cause	NUTDSBLD (Nut Disabled)	
Definition	One (or more) of the ring nodes has been determined to NOT support the NUT feature.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS48c, STS12c, STS3c, STS1 VC4-16c, VC4-4c, VC4, VC3	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Non Allowed state	NA
On-site Indications - User Panel LEDs	None	None
- Circuit Pack Faceplate LED	None	None
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

NUTINXCGRN

Alarm Data	What It Means	
Probable Cause	NUTINXCGRN (NUT Inconsistent XC Operational)	
Definition	The local (or operational) NUT configuration is such that it is causing the protection attributes (for one or more cross-connections in the local node) to be in conflict.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS48c, STS12c, STS3c, STS1 VC4-16c, VC4-4c, VC4, VC3	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Non Allowed state	NA
On-site Indications - User Panel LEDs	None	None
- Circuit Pack Faceplate LED	None	None
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

NUTNOPR

Alarm Data	What It Means	
Probable Cause	NUTNOPR (Local NUT Not Operational)	
Definition	The operational NUT configuration has been inconsistent with the local NUT configuration for a time period of greater than 2-seconds.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS48c, STS12c, STS3c, STS1 VC4-16c, VC4-4c, VC4, VC3	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Non Allowed state	NA
On-site Indications - User Panel LEDs	None	None
- Circuit Pack Faceplate LED	None	None
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

NUTTMPPROV

Alarm Data	**What It Means**	
Probable Cause	NUTTMPPROV (Temporary NUT Provisioned)	
Definition		
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS48c, STS12c, STS3c, STS1 VC4-16c, VC4-4c, VC4, VC3	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Non Allowed state	NA
On-site Indications - User Panel LEDs	None	ABN LED is steady on
- Circuit Pack Faceplate LED	None	None
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

OSILINKERR (DCC Line Disabled-Unavailable)

Alarm Data	What It Means	
Probable Cause	OSILINKERR (DCC Line Disabled-Unavailable)	
Definition	For those BLSR DCCs that are provisioned to use Line rather than Section — an activity has occurred which required allocation of LAPD channels and no channels were available in the working DCC circuit pack. Examples of such provisioning activity are: • A new Optical Port (pre)provisioning • A Protection Group is deleted, and LAPD channels must be allocated for what were the standby DCC channels in the Protection Group.	
Nature of Alarm/Type	Transient	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	Not Alarmed
On-site Indication - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Events* can be used to change the alarm level.	
Trouble-Clearing Task ID	T517	

OSILINKERR (DCC Line Failure)

Alarm Data	What It Means	
Probable Cause	OSILINKERR (DCC Line Failure)	
Definition	The DCC channel has failed due to either DCC hardware/equipment failure or a failure of the transmission facility carrying the active DCC channel.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications - User Panel LEDs	MN	MN
- Circuit Pack LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OCn/EC1 Port* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

OSILINKERR (LinkID Line Mismatch)

Alarm Data	What It Means	
Probable Cause	OSILINKERR (LinkID Line Mismatch)	
Definition	Upon establishing a DCC link with another node, the received LinkID has a LinkID protocol version number which is not supported by this node's LinkID software. Note: The condition will clear only when a LinkID protocol version number is received which is supported.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications - User Panel LEDs	MN	MN
- Circuit Pack Faceplate LED	NO Indication	Flashing RED
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OC-n/EC1 Port* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

OSILINKERR (User-Network Side Line Failure)

Alarm Data	**What It Means**	
Probable Cause	OSILINKERR (User-Network Side Line Failure)	
Definition	Both ends of the LAPD channel have been provisioned as network-network or user-user.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications - User Panel LEDs	MN	MN
- Circuit Pack LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OC-N/EC1 Port* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 516	

OVRDSW (Ring Prot Switching Suspended)

Alarm Data	What It Means	
Probable Cause	OVRDSW (Ring Protection Switching Suspended)	
Definition	Ring protection switching has been disabled, while waiting for ring map discovery to build a valid ring map.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 520	

PAINTGRT (Path Integrity Failure)

Alarm Data	What it Means	
Probable Cause	PAINTGRT (Path Integrity Failure)	
Definition	A circuit through a BLSR/MS-SPRing ring has not been provisioned in all nodes or has been mis-provisioned in one or more nodes.	
Nature of Alarm/Type	Persistent	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
- SDH	VC3, VC4, VC4-4c, VC4-16c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	MJ
- SDH Alarm Level	Not Allowed	MJ
On-site Indications - User Panel LEDs	No indication	MJ
- Circuit Pack faceplate LED	No indication	No indication.
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR/MS-SPRing Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 511	

PAPRVERR (Circuit Provisioning Error)

Alarm Data	What it Means	
Probable Cause	PAPRVERR (Circuit Provisioning Error)	
Definition		
Nature of Alarm/Type	Persistent	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	MN
On-site Indications - User Panel LEDs	No indication	MN
- Circuit Pack faceplate	No indication	flashing Green
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

PDI-P (STS Payload Defect Indicator)

Alarm Data	What it Means	
Probable Cause	PDI-P (STS Payload Defect Indicator)	
Definition	A Payload Defect Indication has been detected for the specified Tributary. This signal is used by the system to initiate DRI/Path Switch.	
Nature of Alarm/Type	Persistent	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c STS12c, STS48c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Reported	Not Reported
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *STS-N(c) Point-to-Point Tributary* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable (Trouble-Clearing actions should be performed beginning at the upstream node).	

PLOS

Alarm Data	**What It Means**	
Probable Cause	PLOS (Pulsed Loss of Signal)	
Definition		
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	OC-N/EC1 or STM-N	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED		
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OCn/EC1 port* or *STM-N* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

PSA (Path Switch Active)

Alarm Data	What it Means	
Probable Cause	PSA (Path Switch Active)	
Definition	Because of some anomaly there has been a switch from the Working path to the Protection path.	
Nature of Alarm/Type	Persistent	Communications
Alarm Type/ Condition Type	Path Protection Group OR Constituent Path Protection Group	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	MN
On-site Indications - User Panel LEDs	No indication	MN
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *DRI-Path* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

PSF
(Path Switch Failure)

Alarm Data	What it Means	
Probable Cause	PSF (Path Switch Failure)	
Definition	A Path Defect was unable to be protected.	
Nature of Alarm/Type	Persistent	Communications
Alarm Type/ Condition Type	Path Protection Group OR Constituent Path Protection Group	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	Not Alarmed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *DRI-Path* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

PSI
(Path Switch Inhibited)

Alarm Data	What it Means	
Probable Cause	PSI (Path Switch Inhibited)	
Definition		
Nature of Alarm/Type	Persistent	Communications
Alarm Type/ Condition Type	Path Protection Group OR Constituent Path Protection Group	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	Not Alarmed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *DIR Path* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

PLM-P (STS Payload Label Mismatch)

Alarm Data	What it Means	
Probable Cause	PLM-P (STS Payload Label Mismatch)	
Definition	The signal being carried in the payload has a defect within the label field. The value in signal label (C2 byte) in the drop direction has an unexpected value (a value other than 01 or 04).	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c	
- T3	DS3 Port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET	CR	Not Applicable
- T3 Alarm Level	CR	Not Applicable
On-site Indications - User Panel LEDs	Flashing Red	Flashing Red
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YSE, ASAP type *Path Terminated (SONET)* can be used to change the alarm level. YES, ASAP type *DS3 Port Outgoing (SONET)* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

RFI-L (Remote Failure Indication – Line)

Alarm Data	What It Means	
Probable Cause	RFI-L (Remote Failure Indication – Line)	
Definition	A RFI-L is declared when an RDI-L persists for 2.5 seconds.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	(NR) Not Reported	(NR) Not Reported
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OCn/EC1 Port* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable at this node. The user action should be to investigate and clear the alarm/cause at the far-end node.	

RFI-P (Remote Failure Indication - Path)

Alarm Data	What it Means	
Probable Cause	RFI-P (Remote Failure Indication – Path)	
Definition	A RFI-P is declared when an RDI-P persists for 2.5 seconds.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3	
- T3	DS3 port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	(NR) Not Reported	Non Allowed state
- T3	(NR) Not Reported	Non Allowed state
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *Path Terminating (SONET)* can be used to change the alarm level. YES, ASAP type *DS3 Port Outgoing (SONET)* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 512	

RNG-CERR (E/W Cable Error)

Alarm Data	What it Means	
Probable Cause	RNG-CERR (East/West - Cable Error)	
Definition		
Nature of Alarm/Type	Persistent	Communications
Type AID affected	BLSR Protection Group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC48, OC192	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Non Allowed state	MJ
On-site Indications - User Panel LEDs	No indication	MJ
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSRProtection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

RNG-DSCVY (Ring Discovery In Progress)

Alarm Data	What It Means	
Probable Cause	RNG-DSCVY (Ring Discovery In Progress)	
Definition	Indication that ring discovery is in progress. The alarm will clear once discovery is completed or ring-map is declared incomplete (ring discovery still continues).	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. This alarm should automatically clear whenever the "Ring Map" is complete.	

RNG-INC (Ring Incomplete)

Alarm Data	What It Means	
Probable Cause	RNG-INC (Ring Incomplete)	
Definition	Ring discovery is declared to be incomplete due to one of the following reasons: • NO LinkID • LinkID Mismatch • ring discovery time-out (5 minutes) • NO OSI association to neighbor. Note: LinkID is a stack manager software entity which identifies an association between neighboring nodes.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 531	

RNG-INITC
(Ring Startup in Progress)

Alarm Data	**What It Means**	
Probable Cause	RNG-INITC (Ring Startup in Progress)	
Definition	Normally, this is a transient condition which indicates the ring network is starting up.	
Nature of Alarm/Type	Transient	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

RNG-IRPM (Inconsistent Ring Protection Mode)

Alarm Data	What It Means	
Probable Cause	RNG-IRPM (Inconsistent Ring Protection Mode)	
Definition	The ring discovery software has determined that all nodes in a ring are NOT provisioned for the same protection mode. Valid protection modes are: • Ring Loopback mode • Transoceanic Shortened Mode. All nodes in a ring must be provisioned to use the same mode.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 532	

RNG-PREEMPT (Extra Traffic Pre-empted)

Alarm Data	**What It Means**	
Probable Cause	RNG-PREEMPT (Extra Traffic Pre-empted)	
Definition	Traffic, which has been cross-connected directly onto protection channels (tributaries), commonly known as extra traffic, has been pre-empted (disconnected) due to an active protection switch. AIS will be inserted on this extra traffic.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not reported	
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

RNG-SQUELCH
(Ring Traffic Squelched)

Alarm Data	What It Means	
Probable Cause	RNG-SQUELCH (Ring Traffic Squelched)	
Definition	Multiple failures have isolated a node or nodes in a ring. Tributaries coming from the isolated node(s) which have drop cross-connections at this node are being squelched. AIS is inserted on any traffic sourced from or destined to the isolated node/nodes to protect against improperly connecting traffic.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group side	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

RNG-URT (Unknown Ring Type)

Alarm Data	What It Means	
Probable Cause	RNG-URT (Unknown Ring Type)	
Definition	The discovered ring type is invalid. Valid ring types are: • Mixed SONET • WaveStar SONET Note: Mixed means a ring contains a mixture of Lucent WaveStar and Non-WaveStar products.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSRProtection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

SCHLD (System Clock Holdover)

Alarm Data	What It Means	
Probable Cause	SCHLD (System Clock Holdover)	
Definition	The internal timing generator has entered the holdover mode. Two possible causes are: (1) A **Forced Switch to Holdover** has been executed, or (2) All assigned timing references have failed. Thus, the internal timing generator is not synchronized externally and has entered the holdover mode.	
Nature of Alarm/Type	Transient	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

SIAC (System in Abnormal Condition)

Alarm Data	What It Means	
Probable Cause	System in Abnormal Condition	
Definition		
Nature of Alarm/Type	Transient	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	No.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

SQM (Sequence Number Mismatch)

Alarm Data	**What it Means**	
Probable Cause	SQM (Ethernet Port – Sequence Number Mismatch)	
Definition	Each VC-n has it's own SQM detection process. The SQM alarm shall be declared whenever the Accepted Sequence Number does not match the corresponding Expected Sequence Number for the VCn in question.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	LAN Port	
Interface Standard	Possible Signal Level Affected	
- 1Gigabit Ethernet	STS1, STS3c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm	CR	(NR) Not Reported
On-site Indications - User Panel LEDs	CR	NR
- Circuit Pack faceplate LED	Flashing Red	NO indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *STS-N Path Terminating SONET* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

SQMAP-CONFL (Local Squelch Map Conflict)

Alarm Data	**What It Means**	
Probable Cause	SQMAP-CONFL (Local Squelch Map Conflict)	
Definition	A cross-connection to/from a BLSR ring has been provisioned with a locA/locZ that is not in the BLSR ring map. This is an error in provisioning of a cross-connection.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MN
On-site Indications	NO Indication	MN
	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

SQMAP-INCST (Ring Squelch Map Inconsistent)

Alarm Data	What It Means	
Probable Cause	SQMAP-INCST (Ring Squelch Map Inconsistent)	
Definition	A provisioning problem indicating that the intermediate source node TID or destination node TID is incorrect.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MN
On-site Indications	NO Indication	MN
	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *BLSR Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

SRM-P (Signal Rate Mismatch – Path)

Alarm Data	**What it Means**	
Probable Cause	SRM-P (Signal Rate Mismatch - Path)	
Definition	SRM-P is declared when one of the following conditions persists for 2.5 seconds: • An optical port is user-provisioned as unprotected (that is, not user-provisioned as part of a facility protection group) and the port is user-provisioned for adaptive rate operation, and the incoming signal rate is greater than the user-provisioned cross-connection rate. • An optical port is user-provisioned as part of a 1+1, 1xN, 2F BLSR, or 4F BLSR port protection group; the working traffic is user-provisioned for adaptive rate operation; and the incoming signal rate (regardless of the protection switch state) is greater than the user-provisioned cross-connection rate. • An optical port is user-provisioned as part of a 1xN, 2F BLSR, or 4F BLSR port protection group; any of the associated working traffic is user-provisioned for fixed rate operation; a protection switch is active; and the incoming signal rate does not match the user-provisioned tributary rate of the associated working traffic. • An optical port is user-provisioned as part of a 1xN, 2F BLSR, or 4F BLSR port protection group; the protection access traffic is user-provisioned for fixed rate operation; no protection switch is active; and the incoming signal rate on the protection access signal does not match the user-provisioned protection access tributary rate.	
Nature of Alarm/Type	Persistent	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MJ	MN
On-site Indications - User Panel LEDs	MJ	MN

Alarm Data	**What it Means**	
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type STS-N(c) Point-to-Point Tributary can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

SYNC (Line Sync Reference Failure)

Alarm Data	What It Means	
Probable Cause	SYNC (Line Sync Reference Failure)	
Definition	An OC48 line which has been provisioned as the synchronization reference for this NE has failed.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Timing Reference	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Reported
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Timing* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 570	

SYNC (Sync Reference Failure)

Alarm Data	What It Means	
Probable Cause	SYNC (Sync Reference Failure)	
Definition	A failure of incoming line or DS1 synchronization reference has been detected.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Timing Reference	
Interface Standard	Possible Signal Level Affected	
- SONET	T1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
On-site Indications - User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Timing* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 513	

SYNCSTATCHNG (System Timing Quality Level Change)

Alarm Data	What it Means	
Probable Cause	SYNCSTATCHNG (System Timing Quality Level Change)	
Definition		
Nature of Alarm/Type	Transient	Communications
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Non Allowed state	Not Applicable
On-site Indications	No indication	No indication
	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *System Events* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

T-BERL (DS3 Bit Error)

Alarm Data	What it Means	
Probable Cause	T-BERL (DS3 Bit Error)	
Definition	The receiver is detecting bit errors at a rate exceeding a default value of 10^{-6} (more than 1 error per every 1,000,000 bits received). The BER threshold may be provisioned from 10^{-3} to 10^{-9}.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MJ (whenever a cross-connection exists)	MN (whenever NO cross-connection exists).
On-site Indications - User Panel LEDs	MJ	MN
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *DS3 Port Incoming* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 521	

T-BERL (Excessive Error-Line)

Alarm Data	**What It Means**	
Probable Cause	T-BERL (Excessive Bit Error Rate – Line)	
Definition	The OC-N/EC1 receiver is detecting bit errors at a rate which exceeds the provisioned threshold value. Each port has a default EBER of 10^{-3}.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *OCn/EC1 Port* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 521	

T-BERL (Bit Error Rate – Signal Degrade Line)

Alarm Data	What It Means	
Probable Cause	T-BERL (Bit Error Rate/Signal Degrade – Line)	
Definition	A receiver is detecting bit errors at a rate which exceeds the provisioned threshold value. Each OC-N port has a default BER of 10^{-5}.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MJ (whenever a cross-connection exists)	MN (whenever NO cross-connection exists).
On-site Indications - User Panel LEDs	MJ	MN
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *automatic protection switching* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 521	

T-BERP (Bit Error/ Signal Degrade – Path)

Alarm Data	What It Means	
Probable Cause	T-BERP (Bit Error/Signal Degrade – Path)	
Definition	The detected Bit Error Ratio for a SONET Tributary exceeds the provisioned threshold.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	NR (Not Reported)	NR (Not Reported)
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, STS-N(c) *Point-to-Point Tributary* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

T-BERP (Excessive Error – Path)

Alarm Data	**What It Means**	
Probable Cause	T-BERP (Excessive Error – Path)	
Definition	Bit Error Rate for a tributary that is in excess of the provisioned threshold.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Reported	Not Reported
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type STS-N(c) *Point-to-Point Tributary* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

UNEQ-P (STS Path Unequipped)

Alarm Data	What It Means	
Probable Cause	UNEQ-P (STS Path Unequipped)	
Definition	The receiver is detecting a *Path Unequipped* condition on a tributary.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical tributary (for SONET signals)	
Type AID Affected	Port (for T3 signals)	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
- T3	DS3 port	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR (STSN)	MN
- T3 Alarm Level	Not Applicable	CR
On-site Indications - User Panel LEDs	CR for SONET NO Indication for T3	MN for SONET CR for T3
- Circuit Pack Faceplate LED	NO Indication	NO Indication for SONET Flashing Red for DS3 Outgoing
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *STS-N(c) Point-to-Point Tributary* can be used to change the alarm level. YES, ASAP type *DS3 Port Outgoing (SONET)* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

VCGSF
(VCG – Signal Fail)

Alarm Data	What it Means	
Probable Cause	VCGSF (VCG – Signal Fail)	
Definition	The status message (in the form of a reply response) failed to complete for the VCn-Xv concatenated group.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	VCG	
Interface Standard	Possible Signal Level Affected	
- 1Gigabit Ethernet	VCG	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- VCG	(NR) Not Reported	(NR) Not Reported
On-site Indications - User Panel LEDs	NR	NR
- Circuit Pack faceplate LED	NO Indication	NO Indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *Ethernet* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

Alarm Messages - Equipment

AGNECF (AGNE Communications Failure)

Alarm Data	**What it Means**	
Probable Cause	AGNECF (AGNE Communications Failure)	
Definition		
Nature of Alarm/Type	Persistent	Equipment
Type AID affected	System	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
System Level	Not Applicable (NA)	MN
On-site Indications - User Panel LED	NA	NA
- Circuit Pack faceplate	No Indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	NO.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

ALS (Automatic Laser Shutdown)

Alarm Data	What it Means	
Probable Cause	ALS (Automatic Laser Shutdown)	
Definition	The Optical Booster Amplifier (OBA) is not receiving an input signal. So, the OBA's output is turned off and the ALS alarm is generated.	
Nature of Alarm/Type	Persistent	Equipment
Possible Circuit Packs affected	OC192STM64, OC48STM16	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack faceplate LED	continuous Red	continuous Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type Equipment can be used to change the alarm level.	
Trouble-Clearing Task ID	T 572	

DCCPR
(DCC Partition Repair)

Alarm Data	**What it Means**	
Probable Cause	DCCPR (DCC Partition Repair)	
Definition		
Nature of Alarm/Type	Transient	Equipment
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	Not Applicable
- SDH Alarm Level	Not Allowed	Not Applicable
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *BLSR/MS-SPRing Protection Switch* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. No user action required.	

EQPT (Circuit Pack Failure)

Alarm Data	What It Means	
Probable Cause	EQPT (Circuit Pack Failure)	
Definition	Internal Fault Algorithms have indicated this pack as defective.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED	Continuous Red	Continuous Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	Refer to T 500.	

INIT-1 (Startup/ Initialization Complete)

Alarm Data	What It Means	
Probable Cause	INIT-1 (Startup/Initialization Complete)	
Definition	A controller has completed its initialization sequence.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Not Applicable	Not Applicable
Can the Alarm Level be Re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID	There are no specific trouble-clearing measures for the *Startup/Initialization Complete* alarm.	

INT
(Fan Failure)

Alarm Data	What It Means	
Probable Cause	INT (Fan Failure)	
Definition	One fan (if the alarm is MN) has failed, or two fans (if the alarm is CR) have failed.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Shelf	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED	Continuous Red	Continuous Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 504	

PRCDRERR (Circuit Pack Invalid)

Alarm Data	**What It Means**	
Probable Cause	PRCDRERR (Circuit Pack Invalid)	
Definition	The circuit pack does not match the provisioning for its slot. For transmission slots, this can occur if a circuit pack is inserted with invalid circuit pack name or qualifier for the current provisioning of the slot. This alarm also occurs if the inventory information on the circuit pack can not be read and thus the system can not determine if the circuit pack is valid for the slot.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Slot	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MN	MN
On-site Indications - User Panel LEDs	MN	MN
- Circuit Pack Faceplate LED	NO Indication	Flashing Green
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

PWR (Power/Fuse Failure)

Alarm Data	What It Means	
Probable Cause	PWR (Power/Fuse Failure)	
Definition	One (or two) power feed to the subject shelf have failed.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Shelf	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED	None Note: If both power feeds have failed - then the shelf will be power-down and there will not be any circuit pack LEDs lighted.	Continuous Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 506	

RCVRY (System in Restoration Mode)

Alarm Data	What It Means	
Probable Cause	RCVRY (System in Restoration Mode)	
Definition	The system has been placed in restoration mode via a user command.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	System	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

REPLUNITMISS (Circuit Pack Unequipped/ Missing)

Alarm Data	What It Means	
Probable Cause	REPLUNITMISS (Circuit Pack Unequipped/Missing)	
Definition	The Circuit Pack has been extracted from its slot.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications - User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED	Not Applicable	Not Applicable
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 533	

REPLUNITMISS (Mate Circuit Pack Unequipped)

Alarm Data	**What It Means**	
Probable Cause	REPLUNITMISS (Mate Circuit Pack Unequipped)	
Definition	Either the OC-192 circuit pack or the associated Pointer Processor circuit pack is not provisioned or has been deleted.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MN	MN
On-site Indications - User Panel LEDs	MN	MN
- Circuit Pack Faceplate LED	NO Indication	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 534	

SCMMA (System in Maintenance Condition)

Alarm Data	What It Means	
Probable Cause	SCMMA (System in Maintenance Condition)	
Definition	System has been placed into maintenance condition either from a user command or autonomous condition (such as extraction of the NVM or corrupt NVM).	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	System	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

SYSBOOT (System Restart)

Alarm Data	What It Means	
Probable Cause	SYSBOOT (System Restart)	
Definition	The main controller is restarting. After the restart has completed a *Startup/Initialization Complete* information will be reported.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Not Applicable	Not Applicable
Can the Alarm Level be Re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID	There are no specific trouble-clearing measures for this alarm.	

TSA
(Alarm Test)

Alarm Data	What It Means	
Probable Cause	TSA (Alarm Test)	
Definition	Indication that the test LED button or the remote test LED command has been executed.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Effect on Service	NO Reported Alarm Level	
On-site Indications - User Panel LEDs	LEDs will cycle on and off.	
- Circuit Pack Faceplate LED	LEDs will cycle on and off.	
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Events* can be used to change the alarm level.	
Trouble-Clearing Task ID	None applicable. This alarm will automatically clear when the test cycle completes.	

UPGRDF
(Upgrade Failed)

Alarm Data	What It Means	
Probable Cause	UPGRDF (Upgrade Failed)	
Definition	An upgrade to a new release of software failed.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

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Alarm Messages — Quality-of-Service

T-{modifiertype} (Threshold Crossing Alert – DS3 Incoming)

Alarm Data	What it Means	
Probable Cause	T-T3modifiertype (Threshold Crossing Alert – DS3 Incoming) Where *modifiertype* can be (one of several including CVL, ESL, and so forth). Refer to the WaveStar TDM 10G User/Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified incoming (receive) DS3 performance monitoring parameter has exceeded the provisioned Quality-Of-Service threshold.	
Nature of Alarm/Type	Transient	Quality-of-Service
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 Incoming	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	No. (To disable, set value to 0 TCA profile edit).	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

T-{modifier type} (Threshold Crossing Alert – DS3 Outgoing)

Alarm Data	What it Means	
Probable Cause	T-T3 (Threshold Crossing Alert – DS3 Outgoing) Where *modifiertype* can be (one of several including CVL, ESL, LOSS-L and so forth). Refer to the WaveStar TDM 10G User/Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified outgoing (transmit) DS3 performance monitoring parameter has exceeded the provisioned Quality-Of-Service threshold.	
Nature of Alarm/Type	Transient	Quality-of-Service
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 Outgoing	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	No	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

T-{modifiertype} (Threshold Crossing Alert – Path Layer)

Alarm Data	What it Means	
Probable Cause	T-STS1, T-STS3c, T-STS12c, T-OC3, T-OC12, T-OC48, T-OC48c, T-OC192 (Threshold Crossing Alert – Path Layer) Where *modifiertype* can be (one of several including CVP, CV-PFE, ESP, and so forth). Refer to the WaveStar TDM 10G User/Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified path layer performance monitoring parameter has exceeded the provisioned Quality-Of-Service threshold	
Nature of Alarm/Type	Transient	Quality-of-Service
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

T-{modifiertype} (Threshold Crossing Alert – Physical Layer)

Alarm Data	What it Means	
Probable Cause	T-LBCN, T-LPT, T-OPR (Threshold Crossing Alert – Physical Layer). Refer to the WaveStar TDM 10G User/ Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified Physical Layer Performance Monitoring Parameter has exceeded the Provisioned Quality-Of-Service Threshold	
Nature of Alarm/Type	Persistent	Quality-of-Service
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	No. (Factory set values and can only be enabled or disabled).	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

T-{modifiertype} (Threshold Crossing Alert – Section/Line or RS/MS layer)

Alarm Data	What it Means	
Probable Cause	T-modifiertype (Threshold Crossing Alert – Section/ Line or RS/MS layer). Where *modifiertype* can be (one of several including CVS, ESS, SESS, and so forth). Refer to the WaveStar TDM 10G User/Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified Regenerator Section/Multiplex Section performance monitoring parameter has exceeded the provisioned Quality-Of-Service threshold	
Nature of Alarm/Type	Transient	Quality-of-Service
Type AID affected	Logical tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Alarmed	Not Alarmed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

Alarm Messages — Processing Error

AUTORESET (Autonomous Reset)

Alarm Data	What It Means	
Probable Cause	AUTORESET (Autonomous Reset)	
Definition	A higher level controller has detected that a lower Level controller has unexpectedly reset. An unexpected reset is one which was not initiated by the higher level controller or via a user command. Unexpected resets are sanity resets which are NOT preceded by a Software Error or Resource Usage - Out-Of-Memory Error. A Manual Button Push is also considered to be an unexpected reset.	
Nature of Alarm/Type	Persistent	Processing Error
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	NO Reported alarm level	NO Reported alarm level
On-site Indications - User Panel LEDs	Various LEDs will flash during the reset cycle.	Various LEDs will flash during the reset cycle.
- Circuit Pack Faceplate LED	Various LEDs will flash during the reset cycle.	Various LEDs will flash during the reset cycle.
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Events* can be used to change the alarm level.	
Trouble-Clearing Task ID	Will automatically clear when completed.	

BKUPMEMO (Non-Volatile Memory Usage)

Alarm Data	What It Means	
Probable Cause	BKUPMEMO (Non-Volatile Memory Usage)	
Definition	Note: There exists, in NVM, a high threshold mark. If this mark is exceeded – then the minimum amount of required space in the NVM has been exceeded. Whenever system usage of NVM is high and has exceeded the minimum amount required as spare.	
Nature of Alarm/Type	Persistent	Processing Error
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MJ	MN
On-site Indications - User Panel LEDs	MJ	MN
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. No user action required.	

DATAFLT
(Memory Mismatch)

Alarm Data	What It Means	
Probable Cause	DATAFLT (Memory Mismatch)	
Definition	The existence of corruption in the user-originated data and NE-originated data throughout all the images held in the NE (NVM, RAM, and hardware device settings).	
Nature of Alarm/Type	Persistent	Processing Error
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MJ	MN
On-site Indications - User Panel LEDs	MJ	MN
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

PROGFLT
(File Error)

Alarm Data	What It Means	
Probable Cause	PROGFLT (File Error)	
Definition	An error occurred during an autonomous (initiated by software) file access to the PCMCIA NVM. This is a non-hardware-related error such as nonrecoverable data corruption or incompatibility errors.	
Nature of Alarm/Type	Transient	Processing Error
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Reported	
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Not applicable	Not applicable
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Events* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

PROCROVLD-1 (Resource Usage)

Alarm Data	What It Means	
Probable Cause	PROCROVLD-1 (Resource Usage)	
Definition	There exists a transient processing error related to usage of a finite resource such as cpu, buffers, and so forth. The "resource type" additional text in the alarm identifies the specific resource.	
Nature of Alarm/Type	Persistent	Processing Error
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MJ	MN
On-site Indications - User Panel LEDs	MJ	MN
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *Equipment* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

SFT (Software Error)

Alarm Data	What It Means	
Probable Cause	SFT (Software Error)	
Definition	The controller software detected an unexpected result such as: • Unexpected case • Unknown/unexpected return value • Index or boundary violations • Bus cycle time-out, and • CPU exceptions (for example, Bus Error, Address Error, Illegal Instruction, Spurious Interrupt, Privilege Violation, Divide by Zero). Software errors are categorized as fatal and non-fatal. A fatal software error will result in an intentional sanity reset (service-preserving for transmission) after alarm processing is complete. A non-fatal software error will only result in an alarm; no reset is performed.	
Nature of Alarm/Type	Transient	Processing Error
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Timing* can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

WKGMEM
(Out of Memory Error)

Alarm Data	**What It Means**	
Probable Cause	WKGMEM (Out of Memory Error)	
Definition	A controller has detected that the High Level Watermark, for Memory Usage, has been reached.	
Nature of Alarm/Type	Transient	Processing Error
Type AID Affected	Circuit Pack	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not applicable	Not Alarmed
On-site Indications - User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	YES, ASAP type *System Events* can be used to change the alarm level.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

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Alarm Messages — Environmental

MISC (Miscellaneous Discretes)

Alarm Data	What it Means	
Probable Cause	MISC (Miscellaneous Discretes)	
Definition	The specified miscellaneous discretes alarm point has been activated. Miscellaneous discretes are user *provisionable alarm points* that must be wired to the NE. Often times, these are used for monitoring other equipment in an office such as power plants, HVAC, and so forth.	
Nature of Alarm/Type	Persistent	Environmental
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Allowed	Not Reported
On-site Indications - User Panel LEDs	Not applicable	No indication
- Circuit Pack faceplate LED	Not applicable	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type *Environmental* can be used to change the alarm level.	
Trouble-Clearing Task ID	T 507	

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Alarm Messages — Security

MAN (Intruder Alert)

Alarm Data	What it Means	
Probable Cause	MAN (Intruder Alert)	
Definition	The number of invalid user authentication attempts has been exceeded. NOTE: For the identified login the provisioned parameter (**User ID Lockout Threshold**) has been exceeded. And, the user cannot login until the provisioned parameter (**User ID Lockout Period**) has expired.	
Nature of Alarm/Type	Information only! NOTE: This alarm will be stored in the **NE Alarm Log** and in the **NE Security Log**.	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- User Id (login) Event	Not Allowed	Not Allowed
On-site Indications - User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	This alarm does not belong to a specific ASAP type, its alarm severity is not provisionable.	
Trouble-Clearing Task ID	This alarm cannot be cleared.	

SSF (System Startup/ Initialization Failure)

Alarm Data	What It Means	
Probable Cause	SSF (System Startup/Initialization Failure)	
Definition		
Nature of Alarm/Type	Persistent	Security
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
Effect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Non Allowed state	NA
On-site Indications	NO Indication	NO Indication
	NO Indication	NO Indication
Can the Alarm Level be Re-provisioned via ASAP?	No.	
Trouble-Clearing Task ID	Please contact your Lucent Technologies local Customer Technical Support team or the Lucent Technologies Service Hotline.	

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Conditions — Protection Switching

1+1 Revertive optical protection change

Protection Switch Data	**What It Means**
Definition	The transmit node simultaneously transmits a single signal on two separate optical links. The receiver monitors these two separate optical links and selects one as the “Working” and the other as the “Standby.” A change in switch selection state can be either the result an external action (for example, a manual or forced command) or an internal action (for example, signal failed or signal degraded, and so forth). Once the switch request state is cleared the receiver will automatic switch back to the other (Working) optical link. Thus, this type of protection switching is referred to as *revertive*.
Switch Request State(s)	- Lockout - Forced - NO request - Signal failed - Signal degraded - Wait to restore - Manual
Condition Type(s)	Description of condition types:
- WKSWPR-2	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC3, OC12, OC48, OC192
Type AID Affected	Port

1+1 Revertive optical protection change, continued

Protection Switch Data	What It Means (Continued)
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	If at least one port of the circuit pack is an active port of a 1+1 protection group, then the circuit pack's Green LED will be lighted continuously.
Can the Condition be Re-provisioned via ASAP?	YES, ASAP type *System Timing* can be used to change the alarm level.

1+1 Non-revertive optical protection change

Protection Switch Data	What It Means
Definition	The transmit node simultaneously transmits a single signal on two separate optical links. The receiver monitors these two separate optical links and selects one as the “Working” and the other as the “Standby”. A change in switch selection state can be either the result an external action (for example, a manual or forced command) or an internal action (for example, signal failed or signal degraded, and so forth). Since there is no switch back, once the switch request state is cleared, this type of switch is referred to as non-revertive.
Switch Request State(s)	- Lockout - Forced - NO request - Signal failed - Signal degraded - Do not revert - Manual
Condition Type(s)	Description of condition types:
- PS (Protection Switch)	- The change of switch selection state from: (a) Working to Protection, or (b) Protection to Working.
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC3, OC12, OC48, OC192

1+1 Non-revertive optical protection change, continued

Protection Switch Data	What It Means (continued)
Type AID Affected	Port
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	If at least one port of the circuit pack is an active port of a 1+1 protection group, then the circuit pack's Green LED will be lighted continuously.

1+1 Optical (optimum) protection change

Protection Switch Data	**What it Means**
Definition	
Switch Request State(s)	- Lockout - Forced - No request - Signal failed - Signal degraded - Do not revert - Failure of protocol
Condition Type(s)	Description of condition types:
- PS (Protection Switch)	- The change of switch selection state from: (a) Working to Protection, or (b) Protection to Working.
- GP (General Purpose)	- No change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC3, OC12, OC48, OC192
Type AID affected	Port
On-site Indications	
- User Panel LEDs	No indication
- Circuit Pack faceplate LED	If at least one port of the circuit pack is an active port of a 1+1 protection group, then the circuit pack's Green LED will be lighted continuously.

1xN Electrical protection change

Protection Switch Data	What it Means
Definition	
Switch Request State(s)	- Lockout - Forced - No request - Equipment failed - Wait to restore - Manual
Condition Type(s)	Description of condition types:
- WKSWPR-N	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- No change in switch selection state - just a change in the state of the switching algorithm.
- INHSWPR	- No protection switch - the switch request state equals Lockout.
Applicable Type(s)	Subtype(s)
- Circuit pack	- DS3
Type AID affected	Port
On-site Indications	
- User Panel LEDs	No indication
- Circuit Pack faceplate LED	If the circuit pack is active, then the circuit pack's Green LED will be lighted continuously.

1+1 Equipment protection change, no change in active units

Protection Switch Data	What It Means
Definition	
Switch Request State(s)	- Forced - NO request
Condition Type(s)	Description of condition types:
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- Circuit Pack	- Timing, Switch
Type AID Affected	Equipment
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	If at least one port of the circuit pack is an active port of a 1+1 protection group, then the circuit pack's Green LED will be lighted continuously.

PATHDRI/ CONSTIUENT PATH protection change

Protection Switch Data	What it Means
Definition	
Switch Request State(s)	- Lockout - Forced - No request - Signal failed - Signal degraded - Wait to restore - Manual
Condition Type(s)	Description of condition types:
- WKSWPR-2	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- No change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- STS1, STS3c, STS12c, STS48c
Type AID affected	Protection Group
On-site Indications	
- User Panel LEDs	No indication
- Circuit Pack faceplate LED	No indication

2-Fiber ring protection change

Protection Switch Data	**What it Means**
Definition	The transmit node simultaneously transmits a single signal on two separate optical links. These links are referred to as the *Working line* and the *Protection line*. The receivers, at each node, monitors the *Working* and *Standby lines*. A change in switch selection state can be either the result an external action (for example, a manual or forced command) or an internal action (for
Switch Request State(s)	- Lockout - Forced - No request - Signal failed - Signal degraded - Wait to restore - Manual - Exercise - Reverse request
Condition Type(s)	Description of condition types:
- WKSWPR-2	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- No change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC48, OC192
Type AID affected	Port
On-site Indications	
- User Panel LEDs	No indication
- Circuit Pack faceplate LED	No indication

Timing reference protection change

Protection Switch Data	What It Means
Definition	
Switch Request State(s)	- Lockout - NO lockout - Forced - NO request - Wait to restore - Manual - Reference failed
Condition Type(s)	Description of condition types:
- INHSWPR	- NO protection switch - the switch request state equals Lockout.
- PS (Protection Switch)	- The change of switch selection state from: (a) Sync reference 0 to sync reference 1, or (b) Sync reference 1 to sync reference 0.
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC48, OC192
Type AID Affected	Timing reference
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	NO Indication

Clock mode protection change

Protection Switch Data	What It Means
Definition	
Switch Request State(s)	- Free running - Holdover (via forced switch) - Holdover (via all references failed) - Locked
Condition Type(s)	Description of condition types:
- FRNGSYNC	- Protection switch, clock mode, free running
- HLDOVRSYNC	- Protection switch, clock mode, forced holdover
- HLDOVRSYNC	- Protection switch, clock mode, holdover
- SYNCCLK	- Protection switch, clock mode, locked
Type AID Affected	System
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	Not applicable

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Error Messages

AID

Error Message Data	Meaning
Definition	The command was partially successful (completion code = PRTL) on an AID range. Meaning, this command was successful for some of the AIDs but not all. Or, if the command did not execute for any of the range of AIDs then (completion code = DENY).
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully “aid” <error code> Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which specified an incorrect range of AIDs.
Corrective Action	Determine the correct AID and AID range. Then, re-try the command.

EATN

Error Message Data	Meaning
Definition	The command failed due to incorrect equipage.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, not valid for Access Type, incorrect equipage Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, that the node’s equipment configuration did not support
Corrective Action	Determine the current equipment configuration for the subject node. Either change the command to match the current equipment configuration or else change the equipment to match the command.

EATN

Error Message Data	Meaning
Definition	The command failed due to a TID mismatch in a retrieved file.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, Not Valid for Access Type, retrieved file TID mismatch Click on OK. Correct the entered data.
Problem/Cause	The node's equipage was not correct for the specified TID.
Corrective Action	Verify that you are logged in to the desired TID. As applicable, check office records and verify the equipage records.

ENEQ

Error Message Data	Meaning
Definition	The command failed due to equipage that is missing.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, Not Equipped Click on OK. Correct the entered data.
Problem/Cause	User entered a command which required equipment that is not currently configured in the node.
Corrective Action	Check office records and verify the equipage records.

ENEQ

Error Message Data	Meaning
Definition	The command was denied because there was not enough space to store/record the output file data.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, Not Equipped, insufficient file space Click on OK. Correct the entered data.
Problem/Cause	Node's NVM is currently removed. Or, the WaveStar CIT does not have sufficient space to receive the backup data file.
Corrective Action	Make sure that the device/location that is to receive the output is equipped and has sufficient room. For example, is the NVM equipped? Or, does the WaveStar CIT's harddisk have sufficient space to receive the node's backup data?

ENSG

Error Message Data	Meaning
Definition	The command was denied because the generic was not available.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, Not Software Generic, generic not available Click on OK. Correct the entered data.
Problem/Cause	The command referred to a particular release of software (generic) that is not currently configured on this node's NVM.
Corrective Action	Only refer to those generic's that are on the NVM.

ERLC

Error Message Data	Meaning
Definition	The command was denied because the cross-connection is currently red-lined.
WaveStar CIT error message	WaveStar CIT Error Command did not execute successfully. Equipage, Red-Lined Circuit Click on OK Correct the entered data
Problem/Cause	User attempted to modify a existing cross-connection that was provisioned with red-line protection.
Corrective Action	Before you can change the cross-connection you must first remove the red-line protection.

ICNV

Error Message Data	Meaning
Definition	Input Command Not Valid.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid Click on OK. Correct the entered data.
Problem/Cause	Command could not be executed. The exact cause could not be determined.
Corrective Action	User must identify the input failure and enter the appropriate input parameter/value.

ICNV

Error Message Data	Meaning
Definition	Input Command Not Valid, missing TID.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid, missing TID Click on OK. Correct the entered data.
Problem/Cause	The command requires a tid value.
Corrective Action	User enters the appropriate tid value.

ICNV

Error Message Data	Meaning
Definition	The command was denied because a required TID was omitted.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid, missing TID Click on OK. Correct the entered data.
Problem/Cause	Execution of this command requires a valid TID.
Corrective Action	Determine the correct TID. Enter the command again with the correct TID.

ICNV

Error Message Data	Meaning
Definition	The command was denied because of an extra AID parameter.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid, extra AID Click on OK. Correct the entered data.
Problem/Cause	User entered to many AID parameters in the AID block than are allowed for this command.
Corrective Action	Determine the correct syntax, or punctuation, and enter the command correctly.

ICNV

Error Message Data	Meaning
Definition	The command was denied because fewer AID parameters were entered than required.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid, required AID missing Click on OK. Correct the entered data.
Problem/Cause	User did not enter the proper number of AID parameters.
Corrective Action	Determine the correct number of AID parameters for this command.

IDNC

Error Message Data	Meaning
Definition	The command was denied because the combination of input parameters was not valid.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Data, Not Consistent Click on OK. Correct the entered data.
Problem/Cause	User entered an invalid set of parameters.
Corrective Action	Determine the correct combination of input parameters and enter the command correctly.

IDNV

Error Message Data	Meaning
Definition	The command was denied because one or more of the input parameter values was not valid.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Data Not Valid Click on OK. Correct the entered data.
Problem/Cause	User entered a command with incorrect input parameters.
Corrective Action	Determine the correct input parameters and re-enter the command correctly.

IDNV

Error Message Data	Meaning
Definition	The command was denied because an incorrect parameter value was entered.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Data Not Valid, invalid <parameter name> Click on OK. Correct the entered data.
Problem/Cause	User entered a command with <name of the input parameter>, which is incorrect for this command.
Corrective Action	Determine the correct parameter, and re-enter the command correctly.

IDRG

Error Message Data	Meaning
Definition	The input parameter range was incorrect.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Data, Range Error Click on OK. Correct the entered data.
Problem/Cause	User entered a command that accepts a range but the given range was incorrect.
Corrective Action	Determine the correct input parameter range and enter the command correctly.

IEAE

Error Message Data	Meaning
Definition	The command was denied because an entity already exists.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Entity Already Exists Click on OK. Correct the entered data.
Problem/Cause	An existing entity (for example, bay-1 or shelf-1) cannot be added since it already exists.
Corrective Action	Verify the current configuration of the node. Most likely you will have attempted to create an entity that already exists. Most likely, changing to an entity that does not exist will be sufficient.

IENE

Error Message Data	Meaning
Definition	The command was denied because of an invalid entry.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Entity Not Exists Click on OK. Correct the entered data.
Problem/Cause	User entered an invalid entity.
Corrective Action	Verify the current configuration of the node and only enter a correct entity.

IIAC

Error Message Data	Meaning
Definition	Illegal syntax in the AID block of the command.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Access identifier, incorrect syntax Click on OK. Correct the entered data.
Problem/Cause	User entered a command which contains an AID block and for which the entered AID was syntactically incorrect.
Corrective Action	Determine the correct syntax and enter the command correctly.

IIAC

Error Message Data	Meaning
Definition	Entered command has correct syntax but contains an unknown value.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Access identifier, unknown AID Click on OK. Correct the entered data.
Problem/Cause	User entered a command which contains an AID block and for which the entered AID is an unknown value.
Corrective Action	Determine the correct value for this command and re-enter the command.

IICT

Error Message Data	Meaning
Definition	The CTAG value was non-NULL but still invalid.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Correlation Tag (CTAG), incorrect syntax Click on OK. Correct the entered data.
Problem/Cause	The CTAG value, that was entered, is invalid.
Corrective Action	Determine the correct/appropriate CTAG values and re-enter the command.

IISP

Error Message Data	Meaning
Definition	The command is not recognized for this product.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Syntax or Punctuation Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which contained either a syntax or punctuation error.
Corrective Action	Determine the correct syntax, or punctuation, and re-enter the command.

IISP

Error Message Data	Meaning
Definition	The command was denied because it exceeded the maximum number of characters.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Syntax or Punctuation, command too long Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which contained more than 488 characters.
Corrective Action	Determine the correct syntax, or punctuation, and enter the command correctly.

IITA

Error Message Data	Meaning
Definition	The command was denied because it has a syntactically incorrect TID.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Target identifier, incorrect syntax Click on OK. Correct the entered data.
Problem/Cause	User entered improper command.
Corrective Action	Determine the correct syntax for the TID and re-enter the command.

IITA

Error Message Data	Meaning
Definition	The command was denied because an unknown TID was entered.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid TID, Unknown TID Click on OK. Correct the entered data.
Problem/Cause	User entered a command that specified a TID which is unknown to this network.
Corrective Action	View the ring map in order to determine the appropriate TIDs. Re-enter the command with the desired/ appropriate TID.

INUP

Error Message Data	Meaning
Definition	The input command failed because of an incorrect parameter type.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Non-null Un-implemented Parameter Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which contained an incorrect parameter type.
Corrective Action	Determine the correct parameter type, and enter the command correctly.

IPNC

Error Message Data	Meaning
Definition	The command was denied because of an invalid command qualifier.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Parameter Not Consistent Click on OK. Correct the entered data.
Problem/Cause	User entered a command which did not parse because of an incorrect command qualifier.
Corrective Action	Determine the correct command qualifier, and enter the command correctly.

PICC

Error Message Data	Meaning
Definition	The command was denied because the user did not have sufficient privileges to execute this command.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Privilege, Illegal Command Code Click on OK. Correct the entered data.
Problem/Cause	This command did not execute because it requires a privilege higher than that of the user issuing the command, or for other security reasons.
Corrective Action	Contact the system administrator.

PLNA

Error Message Data	Meaning
Definition	The login session was not fully initialized whenever this command was issued.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Privilege, Login Not Active Click on OK. Correct the entered data.
Problem/Cause	The command was denied because it was entered before a session had been initiated with ACT-USER.
Corrective Action	Try the command again.

SABT

Error Message Data	Meaning
Definition	The command was denied because it was aborted.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Aborted Click on OK. Correct the entered data.
Problem/Cause	User or administrator aborted this command before it completed.
Corrective Action	NONE

SARB

Error Message Data	Meaning
Definition	The command was denied because it is experiencing temporary exhaust of allocated resources.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, All Resources Busy, system limit exceeded Click on OK. Correct the entered data.
Problem/Cause	Currently not enough system processing resources to properly execute this command.
Corrective Action	Try the command at a later time.

SCNA

Error Message Data	Meaning
Definition	The command was denied because the system could not abort it.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Command Not Able to be aborted Click on OK. Correct the entered data.
Problem/Cause	User attempted to abort a command but the system could not abort - thus this error message.
Corrective Action	NONE.

SCNF

Error Message Data	Meaning
Definition	The command is not recognized for this product.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Command Not Found, command not recognized Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which was not found in the system's command parse tree.
Corrective Action	Only enter commands that apply to this product.

SDNC

Error Message Data	Meaning
Definition	The command was denied because of an invalid entry.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Data Not Consistent, invalid instance of entity Click on OK. Correct the entered data.
Problem/Cause	User entered an invalid entity for this node or command.
Corrective Action	Determine the correct entity and enter the command correctly.

SNVS

Error Message Data	Meaning
Definition	The command was denied because of mode, state, or status.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Not in Valid State Click on OK. Correct the entered data.
Problem/Cause	User entered a command for which the status was not valid for this node.
Corrective Action	.

SNVS

Error Message Data	Meaning
Definition	The command was denied because it cannot be executed while in Maintenance Condition.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Not in Valid State, maintenance condition Click on OK. Correct the entered data.
Problem/Cause	User entered a command that can only be executed while the node is NOT in Maintenance Condition.
Corrective Action	Exit Maintenance Condition and re-enter the command.

SNVS

Error Message Data	Meaning
Definition	The command was denied because the node is currently in Restoration Mode.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Not in Valid State, restoration mode Click on OK. Correct the entered data.
Problem/Cause	User entered a command that cannot be executed while the node is in Restoration Mode.
Corrective Action	Re-enter the command whenever the node is out of Restoration Mode.

SNVS

Error Message Data	Meaning
Definition	The command was denied because it cannot be executed until the node has successfully completed it's initialization.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Not in Valid State, system initializing Click on OK. Correct the entered data.
Problem/Cause	User entered a command while the node was still in the process of re-initializing.
Corrective Action	Wait until the node has completed initializing and then re-enter the command.

SRAC

Error Message Data	Meaning
Definition	The command was denied because it was issued to the wrong product/NE.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Requested Access Configuration is invalid, retrieved file NE mismatch Click on OK. Correct the entered data.
Problem/Cause	User issued a command that either contained an incorrect product name or user was logged in to the wrong node.
Corrective Action	User should verify that they are logged into the desired and appropriate NE. Re-issue the command again when logged in to the desired node. Ensure that only the correct and desired product name is used

SROF

Error Message Data	Meaning
Definition	The command was denied because of a failure to communicate with the external node.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Requested Operation Failed, external communications failure Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which contained more than 488 characters.
Corrective Action	Identify and correct any path related alarms (for example, LOS, or DCC Section failure) exist on this ring.

SROF

Error Message Data	Meaning
Definition	The command was denied because of non-hardware issues.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Requested Operation Failed Click on OK. Correct the entered data.
Problem/Cause	Most likely cause is improper provisioning.
Corrective Action	Identify and correctly provision the related system parameters.

SSRE

Error Message Data	Meaning
Definition	The command was denied because it attempted to exceed an internal resource limit.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, System Resources Exceeded, allowed limit exceeded Click on OK. Correct the entered data.
Problem/Cause	The system is busy processing higher priority commands.
Corrective Action	Retry the command later whenever the node is not as busy.

SSTP

Error Message Data	Meaning
Definition	The command was denied because of a problem with the target hardware.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Stopped, failed target hardware Click on OK. Correct the entered data.
Problem/Cause	The node, which is the target of this command, has a hardware problem that prohibited successful execution of this command.
Corrective Action	Identify and fix the failed target hardware.

SWFA

Error Message Data	Meaning
Definition	The command was denied because the control hardware is failed, missing, or initializing.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Working unit Failed, control hardware failed, missing or initializing Click on OK. Correct the entered data.
Problem/Cause	Hardware related failure.
Corrective Action	Wait for any currently initializing hardware to complete those activities, or replace any missing or failed hardware.

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2 Maintenance and Trouble-Clearing

Overview

Purpose

This chapter defines the maintenance philosophy and describes the features available to monitor and maintain the WaveStar TDM 2.5G/10G (2-Fiber) system.

Objectives

This chapter provides information to perform the following:

- Define the maintenance philosophy for the WaveStar TDM 2.5G/10G (2-Fiber) system
- Recognize the types of protection switching performed by the WaveStar TDM 2.5G/10G (2-Fiber) system
- Describe the features that are available to monitor and maintain the WaveStar TDM 2.5G/10G (2-Fiber) system

Related tasks

For related trouble-clearing tasks, see Part I, Trouble-Clearing Tasks in this manual.

Contents This chapter provides the following information:

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Maintenance Philosophy

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system allows operation and maintenance of network elements in a network from a centralized location. The WaveStar TDM 2.5G/10G (2-Fiber) system continuously monitors the equipment and incoming signals, and reports any current or potential troubles. This enables the user to take the appropriate corrective action.

Proactive maintenance

The WaveStar TDM 2.5G/10G (2-Fiber) system supports proactive and reactive maintenance. Proactive maintenance refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending failure.

Proactive maintenance consists of monitoring performance parameters associated with the SONET sections, lines, and paths within the network.

For more information about performance monitoring refer to *Chapter 8, Performance Monitoring* in *365-371-210, WaveStar 2.5G/ 10G (2-Fiber) User Operations Guide*.

Reactive maintenance

Reactive maintenance occurs after an equipment (circuit pack) or transport (signal) failure. The LEDs on the user panel and circuit pack faceplates report internal troubles. Most troubles can be detected and corrected at this level. The WaveStar Craft Interface Terminal (WaveStar CIT) may be used to retrieve detailed reports about performance monitoring, alarm and status, and configurations for network elements in a network.

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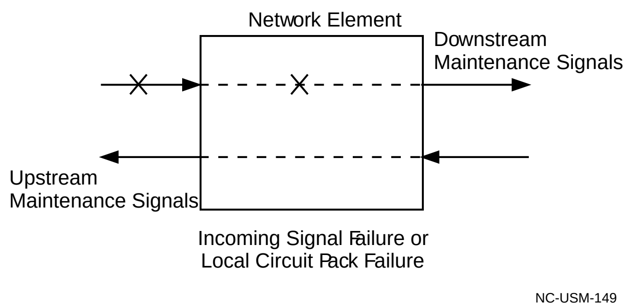
Maintenance Signals

Introduction

When the WaveStar TDM 2.5G/10G (2-Fiber) system detects failure conditions on transmission signals, maintenance signals are inserted into the transmission signals in the upstream or downstream direction to notify other network elements.

Upstream/downstream maintenance signals

The following figure shows the relationship between failures and upstream/downstream maintenance signals.



Supported maintenance signals

The WaveStar TDM 2.5G/10G (2-Fiber) system supports the following maintenance signals:

- Alarm indication signals (AIS)
- Remote defect indication (RDI) signals
- Remote error indication (REI) signals
- Path trace signals
- Section trace signals (Release 5 and later)
- Path unequipped signals
- DS3 idle signals
- Payload defect indicator signals

Alarm indication signals (AIS)

Alarm indication signals (AIS) notify downstream equipment that a failure has been detected and alarmed by some upstream equipment. The WaveStar TDM 2.5G/10G (2-Fiber) system generates the following alarm indication signals:

- SONET path AIS: A SONET path AIS signal is generated downstream after a loss of signal (LOS), loss of frame (LOF), alarm indication signal, or loss of pointer (LOP) is detected on the incoming SONET signal, or local equipment failure is detected.

- DS3 AIS: A DS3 AIS signal is generated downstream after an LOS, LOF, alarm indication signal, payload label mismatch, LOP, excessive bit error rate (BER) is detected on the incoming DS3 signal or STS-1 path, or local equipment failure is detected.

Remote defect indication (RDI) signals

Remote defect indication (RDI) signals notify upstream equipment that a downstream failure has been detected. The WaveStar TDM 2.5G/10G (2-Fiber) system generates the following remote defect indication signals:

- SONET line RDI signal: A SONET line RDI signal is generated upstream after a loss of signal (LOS), loss of frame (LOF), or line alarm indication signal is detected on the incoming SONET signal.
- SONET path RDI signal: A SONET path RDI signal is generated upstream after a loss of pointer (LOP) or path alarm indication signal is detected on the incoming SONET signal.

Remote error indication (REI) signals

Remote error indication (REI) signals notify upstream equipment about the number of incoming interleaved-bit block errors it has detected. The WaveStar TDM 2.5G/10G (2-Fiber) system generates the following remote error indication signals:

- SONET line REI signal: A SONET line REI signal is generated upstream to indicate the interleaved-bit block error count based on the incoming line B2 byte.
- SONET path REI signal: A SONET path REI signal is generated upstream to indicate the interleaved-bit block error count based on the incoming STS path B3 byte.

Path trace signals

Path trace signals are transmitted repetitively to verify path continuity. The DS3EC1/8 port unit generates and terminates the path overhead. Thus, the OC3/STM1, OC12/STM4, OC48/STM16, and OC192/STM64 port units pass through any path trace signals. The value of the transmit path trace signals is provisionable for DS3 ports only. However, the WaveStar TDM 2.5G/10G (2-Fiber) system can retrieve the value of the path trace signal for any SONET port. The WaveStar TDM 2.5G/10G (2-Fiber) system supports SONET STS-1, STS-3c, and STS-12c path trace signals.

Section trace signals

Section trace signals are transmitted repetitively in the section overhead to verify continuity. The OC3/STM1, OC12/STM4, OC48/STM16, and OC192/STM64 port units generate and terminate the section overhead. The value of the transmit section trace signals is provisionable for any SONET port. The WaveStar TDM 2.5G/10G (2-Fiber) system can also retrieve the value of the section trace signal for any SONET port.

Path unequipped signals

Path unequipped signals are transmitted to notify downstream equipment that the path is incomplete (for example, a port in the AUTO state or the absence of a valid cross-connection). The WaveStar TDM 2.5G/10G (2-Fiber) system supports the following path unequipped signals:

- SONET STS-1 path unequipped
- SONET STS-3c path unequipped
- SONET STS-12c path unequipped
- SONET STS-48c path unequipped

DS3 idle signals

The DS3 idle signal is transmitted repetitively on an outgoing DS3 line. The WaveStar TDM 2.5G/10G (2-Fiber) system generates a DS3 idle signal on an outgoing DS3 line after the following:

- The DS3 line has its output mode set to Terminated with DS3 Idle selected.
- The Path Termination Monitoring Point was provisioned as SONET, the “TF FM - XC dependency” of the Path Termination Monitoring Point is set to “yes,” and no cross-connection is provisioned in the DS3 output direction.

Path payload defect indicator signals

Path payload defect indicator signals are embedded in STS-1 signals to notify downstream equipment about incoming DS3 signal defects. The WaveStar TDM 2.5G/10G (2-Fiber) system generates path payload defect indicator signals when DS3 AIS or loss of signal (LOS) defects are detected on the incoming DS3 line.

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Transport Fault Detection and Isolation

Fault detection

The WaveStar TDM 2.5G/10G (2-Fiber) system continuously monitors its internal condition and incoming signals according to the state of the tributaries and ports. (For information about tributary and port states and transitions, refer 365-371-210, *WaveStar TDM 2.5G/10G (2-Fiber), User Operations Guide*.) If a port or tributary is in the MON (Monitored) state, the WaveStar TDM 2.5G/10G (2-Fiber) system monitors the port/tributary and activates the appropriate indicators when a failure occurs.

Monitored/detected transport failures

The following table shows the incoming signals and the associated failures the WaveStar TDM 2.5G/10G (2-Fiber) system monitors and detects.

Incoming Signals	Monitored/Detected Failures
OC-192/OC-48/ OC-12/OC-3	Loss of Signal Loss of Frame Alarm Indication Signal-Line Remote Failure Indication Excessive Error Bit Error/Signal Degrade DCC Sect Failure DCC Line Failure LinkID Sect Mismatch LinkID Line Mismatch User-Network Side Sect Failure User-Network Side Line Failure DCC Sect Disabled-Unavailable DCC Line Disabled-Unavailable
DS3	DS3 Loss of Signal DS3 Loss of Frame Alarm Indication Signal- DS3 DS3 Bit Error DS3 Idle Signal

Fault isolation

When a failure is detected, the WaveStar TDM 2.5G/10G (2-Fiber) system employs automatic diagnostics to isolate the failure. Most failures are isolated to an incoming line, section, path, terminated path, or incoming DS3. Failures are reported to the local technician and operations systems so that repair decisions can be made. If desired, operations system personnel and the local technician can use the WaveStar CIT to gain more detailed information on the trouble condition.

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Equipment Fault Detection and Isolation

Fault detection

The WaveStar TDM 2.5G/10G (2-Fiber) system continuously monitors its internal condition according to the state of the circuit pack slots. (For information about circuit pack states and transitions, refer 365-371-210, *WaveStar TDM 2.5G/10G (2-Fiber), User Operations Guide*.) If a circuit pack is in the MON (Monitored) state, the WaveStar TDM 2.5G/10G (2-Fiber) system monitors the circuit pack and activates the appropriate indicators when a failure occurs.

Monitored/detected equipment failures

The WaveStar BandWidth Manager system monitors and detects the following equipment failures:

- Circuit Pack Failure - Circuit Pack
- Circuit Pack Unequipped/Missing - Circuit Pack
- Mate Circuit Pack Unequipped - Circuit Pack
- Circuit Pack Invalid - Slot
- Non-Volatile Memory Wearout - Circuit Pack
- Power/Fuse Failure - Shelf
- Fan Failure - Shelf
- Automatic Laser Shutdown - Circuit Pack
- Alarm Test - System

Fault isolation

When a failure is detected, the WaveStar TDM 2.5G/10G (2-Fiber) system employs automatic diagnostics to isolate the failed equipment. Most failures are isolated to a maximum of two circuit packs, but some failures may be isolated to more than two circuit packs. Failures are reported to the local technician and operations systems so that repair decisions can be made. If desired, operations system personnel and the local technician can use the WaveStar CIT to gain more detailed information on the trouble condition.

□

Fault Reporting

Introduction

All failures detected and isolated by the WaveStar TDM 2.5G/10G (2-Fiber) system are stored and made available to be reported, on demand, through the WaveStar CIT. In addition, a history of the past 512 alarm notifications is maintained and available for on-demand reporting. Each alarm notification is date and time stamped.

Fault reporting indicators

The WaveStar TDM 2.5G/10G (2-Fiber) system also automatically reports all failures through indicators that are subject to the provisionable parameters:

- Facility alarm generate delay interval: The alarm generate delay interval is the amount of time (0 to 60 seconds) that the system waits, after it detects a facility failure, before reporting the failure using all indicators.
- Facility alarm clear delay interval: The alarm clear delay interval is the amount of time (0 to 60 seconds) that the system waits, after a facility failure clears, before reporting that the failure has cleared using all indicators.
- Equipment alarm generate delay interval: The alarm generate delay interval is the amount of time (0 to 60 seconds) that the system waits, after it detects an equipment failure, before reporting the failure using all indicators.
- Equipment alarm clear delay interval: The alarm clear delay interval is the amount of time (0 to 60 seconds) that the system waits, after an equipment failure clears, before reporting that the failure has cleared using all indicators.

For more information about the **Configuration>Alarms>Alarm Configuration...** command, refer to the online help available with the WaveStar CIT.

Alarm severity assignment profiles

The alarm severity assignment profiles (ASAP) allow users to provision the severity of failures. For more information about alarm severity assignment profiles, refer to 365-371-210, *WaveStar TDM 2.5G/10G (2-Fiber) User Operations Guide*. For more information about the **Configuration>Alarms>Alarm Severity Assignment Profile...** command, refer to the online help available with the WaveStar CIT.

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Maintenance Condition State

Introduction

The maintenance condition state is a state that the WaveStar TDM 2.5G/10G (2-Fiber) system enters to protect the system cross-connection and provisioning data during:

- Software installations and upgrades
- Manual database restorals

During the maintenance condition state, the system performs no processing; however, it does maintain external interfaces (for example, WaveStar CIT) and performs automatic protection switching within the shelves (outside of the system control complex

Entering the maintenance condition state

The WaveStar TDM 2.5G/10G (2-Fiber) system enters the maintenance condition state automatically or manually. The WaveStar TDM 2.5G/10G (2-Fiber) system automatically enters the maintenance condition state when:

- An established shelf is unavailable during system controller start-up
- The primary memory is corrupted or unavailable

The WaveStar TDM 2.5G/10G (2-Fiber) system must be manually entered in the maintenance condition state before:

- Installing or upgrading software
- Manually restoring the database from a previously backed-up version

The **Fault>Enter/Exit Maintenance Condition** command is used to manually enter the maintenance condition state. For more information about the **Fault>Enter/Exit Maintenance Condition** command, refer to the online help available with the WaveStar CIT.

System behavior during the maintenance condition state

During the maintenance condition state, the WaveStar TDM 2.5G/10G (2-Fiber) system allows commands that support the following functions:

- Back up and restore database
- Download and install software
- Exit maintenance condition
- Log in and log out of the system
- Modify node - TID
- Operate system reset
- Retrieve system software and database information
- Retrieve system provisioning information
- Update generic control information

During the maintenance condition state, the WaveStar TDM 2.5G/10G (2-Fiber) system also disables the auto discovery of circuit packs. The auto discovery mechanism is re-enabled when the system exits the maintenance condition state. Any new circuit packs inserted while the system is in maintenance condition state are discovered when the system exits the maintenance condition. The removal of circuit packs is detected and processed while the system is in maintenance condition state.

Autonomous processing performed by the system during the maintenance condition state is restricted to switch, and fault and alarm processing. Any changes to network element originated data during the maintenance condition state is uploaded into memory when the system exits the maintenance condition state.

The WaveStar TDM 2.5G/10G (2-Fiber) system also continues to generate notifications and autonomous messages during the maintenance condition state. However, these notifications and messages are restricted based on the available entities.

Exiting the maintenance condition state

The WaveStar TDM 2.5G/10G (2-Fiber) system exits the maintenance condition state automatically or manually. The WaveStar TDM 2.5G/10G (2-Fiber) system automatically exits the maintenance condition state when:

- The system is restarted after installing/upgrading software
- The active system controller is restarted

The **Fault>Enter/Exit Maintenance Condition** command is used to manually exit the maintenance condition state. For more information about the **Fault>Enter/Exit Maintenance Condition** command, refer to the online help available with the WaveStar CIT.

The WaveStar TDM 2.5G/10G (2-Fiber) system performs the following in sequence when exiting the maintenance condition state:

- Uploads all network element originated data (which is limited to protection switch data) and freezes changes to those values. The system issues any appropriate protection switch change reports at this time.
- Updates any applicable alarm logs.
- Executes a service preserving restart to download the executable code and database (user and network element originated date) to the entire system.
- Issues the appropriate alarm reports and state change reports.

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2-Fiber Bidirectional Line-Switched Ring Switching

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system performs 2-fiber bidirectional line-switched ring (BLSR) protection switching in response to automatically detected faults in OC-48 and OC-192 lines and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault>Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities

The following table shows the 2-fiber BLSR protection switch priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection - Span	WaveStar CIT/OS
Forced of Service to Protection, Ring	WaveStar CIT/OS
Signal Fail - Ring	Automatic
Signal Degrade - Ring	Automatic
Manual Switch to Protection - Ring	WaveStar CIT/OS
Wait to Restore	Automatic
Reverse Request - Ring	Automatic

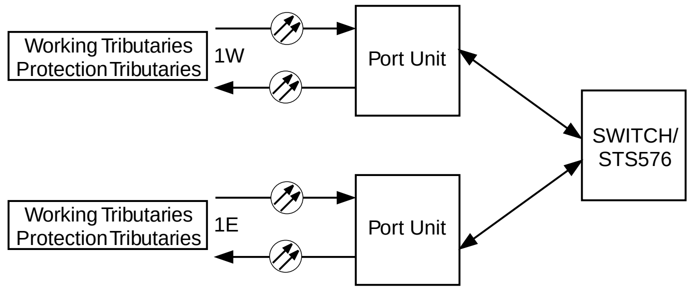
If a higher or equal priority switch request exists, a new switch request is denied.

Bidirectional revertive protection switching

The optical line uses bidirectional revertive 2-fiber ring protection switching. Bidirectional refers to protection switching that is performed in the transmit and receive directions simultaneously. The traffic switches from the working tributaries of one line to the protection tributaries of the line in the opposite direction when a fault is detected. In revertive switching when the fault and wait-to-restore interval clear, the traffic switches back (reverts) to the working tributaries.

2-fiber BLSR architecture

The following figure shows the 2-fiber BLSR protection switching architecture.



There are working tributaries carrying service on Line 1W and Line 1E. The tributaries not carrying service on each line are the protection tributaries. The protection tributaries on Line 1W are used to protect the working tributaries on Line 1E, and the protection tributaries on Line 1E are used to protect the working tributaries on Line 1W. The protection switching is performed by the SWITCH/STS576 circuit pack.

OC-48 2-fiber ring tributary mapping

The following table shows the mapping between the service STS-1 tributaries and their protection STS-1 tributaries on the other optical line in 2-fiber OC-48 BLSR applications.

Service STS-1 Tributary	Protection STS-1 Tributary on other OC-48 Line
1 through 24	25 through 48, respectively

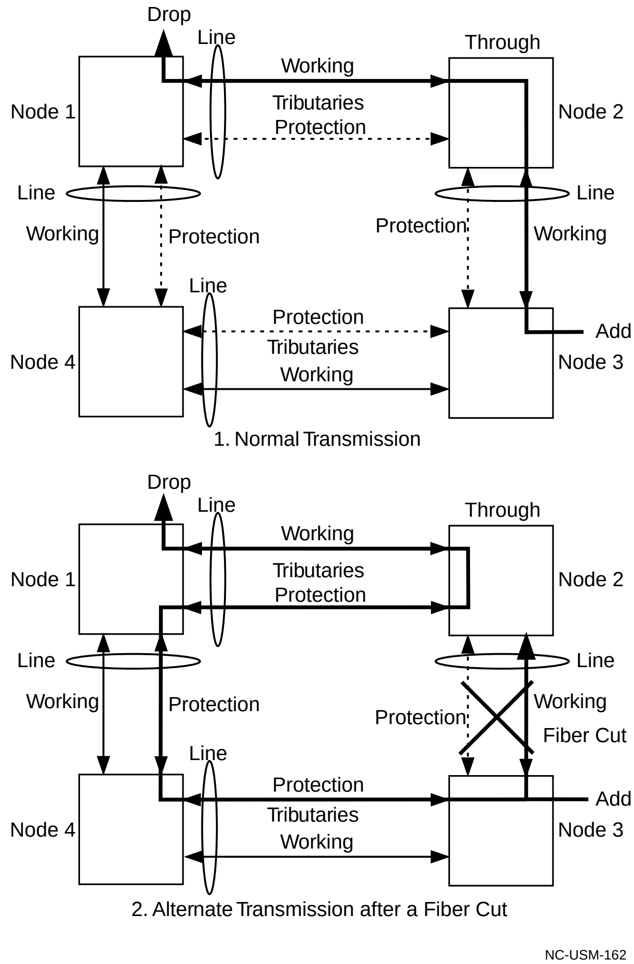
OC-192 2-fiber ring tributary mapping

The following table shows the mapping between the service STS-1 tributaries and their protection STS-1 tributaries on the other optical line in 2-fiber OC-192 BLSR applications.

Service STS-1 Tributary	Protection STS-1 Tributary on other OC-192 Line
1 through 96	97 through 192, respectively

2-fiber BLSR protection switching example

The following figure shows an example of 2-fiber BLSR protection switching. Only one direction of transmission is shown; however, 2-fiber BLSR switching is bidirectional. Node 1 also bridges traffic to the protection line, and Node 3 also selects traffic from the protection line.



For 2-fiber ring protection switching, the nodes adjacent to the failure make connections to bridge the add and through traffic to the protection tributaries of the line in the other direction. All drop and through traffic is selected from the protection tributaries of the line in the other direction.

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Unidirectional Path-Switched Ring Switching

Introduction

Beginning in Release 5, the WaveStar TDM 2.5G/10G (2-Fiber) system performs unidirectional path-switched ring (UPSR) switching in response to automatically detected faults in paths and external commands from a WaveStar CIT or operations support system (OSS). The WaveStar TDM 2.5G/10G (2-Fiber) system supports UPSR switching for STS-1, STS-3c, STS-12c, and STS-48c paths in OC-12, OC-48, and OC-192 UPSR rings. For more information about the **Fault>Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities

The following table shows the UPSR protection switch priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection - Span	WaveStar CIT/OS
Forced Switch (to Working/Protection)	WaveStar CIT/OS
Automatic Path Selector Criteria	Automatic
Manual Switch (to Working/ Protection)	WaveStar CIT/OS
Wait to Restore (revertive mode)	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

> **Important!** The Forced Switch to Working and Manual Switch to Protection switch priorities apply to the nonrevertive mode only.

Automatic path selector criteria

The WaveStar TDM 2.5G/10G (2-Fiber) system performs automatic UPSR switching based on the automatic path selector criteria. The automatic path selector criteria uses the following hierarchy of signal impairments (ordered from top to bottom in increasing signal quality):

- LOP-P, AIS-P, UNEQ-P, and signal rate mismatch (SRM) (most impaired - worst signal quality)
- Excessive STS Path BER
- STS PDI-P
- STS signal degrade (least impaired)
- Path-level signal with no impairments.

The WaveStar TDM 2.5G/10G (2-Fiber) system selects the path-level signal with the best quality.

Unidirectional switching

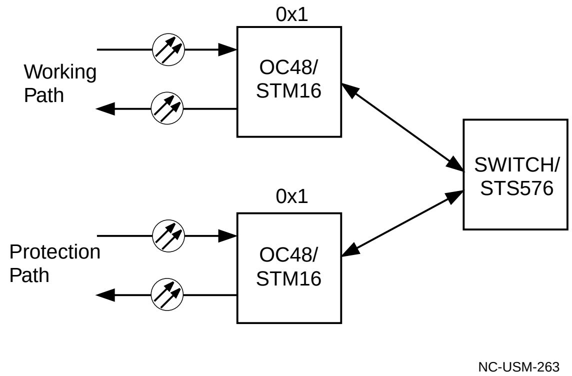
The UPSR switching is unidirectional. Unidirectional refers to protection switching that is performed in the receive direction only. The transmitting terminal transmits the same path-level signal on two lines. The receiving terminal monitors the two path-level signals independently and chooses one path-level signal as the working (active) path and the other path-level signal as the protection path. The WaveStar TDM 2.5G/10G (2-Fiber) system selects the incoming path-level signal with the best quality (based on the automatic path selector criteria).

Revertive/nonrevertive switching

The UPSR switching may be provisioned as revertive or nonrevertive. When a protection switch occurs, the receiving terminal selects the signal from the protection path. In revertive switching when the fault clears, the receiving terminal automatically switches back (reverts) to the original working path. In nonrevertive switching when the fault clears, the receiving terminal does *not* switch back to the original working path.

UPSR architecture

The following figure shows an example of the UPSR protection switching architecture with OC48/STM16 port units.

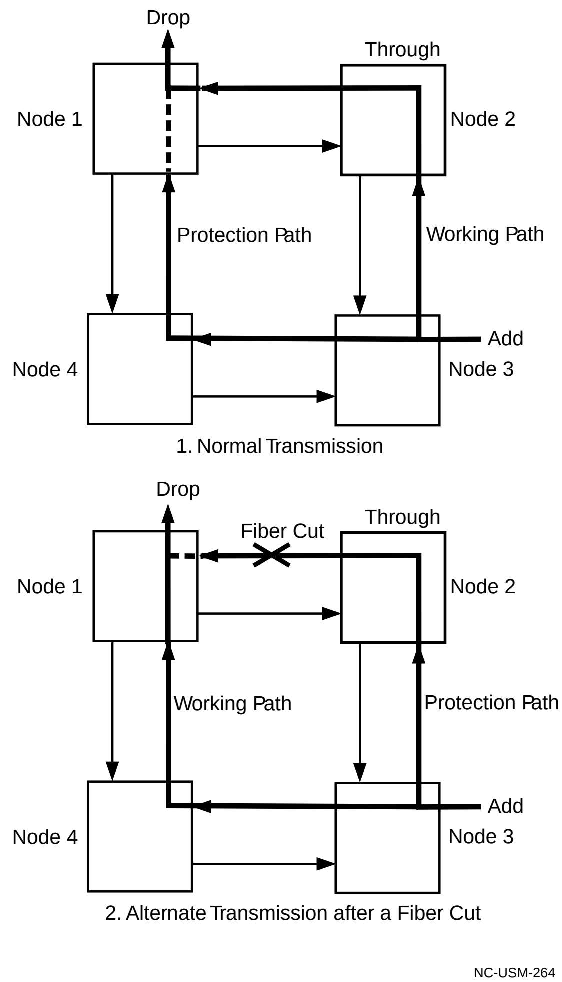


The UPSR switching is performed in the receive (toward the SWITCH/STS576 circuit pack) direction. If the active incoming path-level signal fails, the working SWITCH/STS576 circuit pack chooses the protection path-level signal.

In the transmit (toward the optical line) direction, the working SWITCH/STS576 circuit pack bridges the same path-level signal to the working and protection paths.

UPSR switching example

The following figure shows an example of UPSR switching.



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1+1 Optical Port Protection Switching

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system performs 1+1 optical port protection switching for OC-48 (Release 4 and later), OC-12 and OC-3 ports. Optical port protection switching takes place in response to automatically detected faults and external commands from a CIT or operations system (OS). For more information about the **Fault>Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities (unidirectional 1+1 protection switching)

The following table shows the unidirectional 1+1 optical port protection switch priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection	WaveStar CIT/OS
Forced Switch (to Working or Protection)	WaveStar CIT/OS
Signal Fail (Working or Protection)	Automatic
Signal Degrade (Working or Protection)	Automatic
Manual Switch (to Working or Protection)	WaveStar CIT/OS
Wait to Restore or Do Not Revert	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Switch request priorities (bidirectional 1+1 protection switching)

The following table shows the bidirectional 1+1 optical port protection switch priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection or Forced Switch to Working	WaveStar CIT/OS
Signal Fail on Protection	Automatic
Forced Switch to Protection	WaveStar CIT/OS
Signal Fail on Working	Automatic
Signal Degrade on Working or Protection	Automatic
Manual Switch to Working or Protection	WaveStar CIT/OS
Wait to Restore or Do Not Revert	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Operation

In 1+1 optical port protection switching, the transmitting terminal transmits the same signal on two lines. The receiving terminal monitors the two lines independently and chooses one line as the working (active) line and the other line as the protection line. When a protection switch occurs, the receiving terminal selects the signal from the protection line.

Unidirectional/bidirectional switching

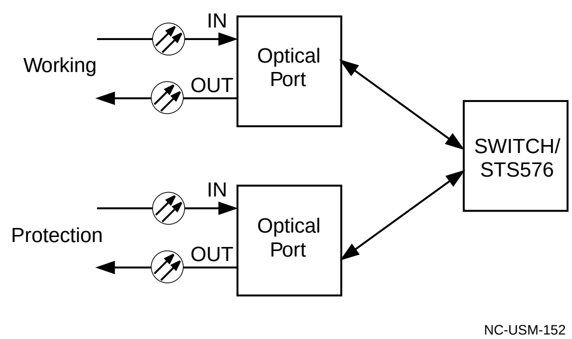
The WaveStar TDM 2.5G/10G (2-Fiber) system uses provisionable unidirectional or bidirectional (Release 5 and later) 1+1 port protection switching. Unidirectional refers to protection switching that is performed in one direction (transmit or receive) only. Bidirectional refers to protection switching that is performed in both directions of transmission simultaneously.

Revertive/nonrevertive switching

The 1+1 port protection switching may be provisioned as revertive or nonrevertive. When a protection switch occurs, the receiving terminal selects the signal from the protection path. In revertive switching when the fault clears, the receiving terminal automatically switches back (reverts) to the original working path. In nonrevertive switching when the fault clears, the receiving terminal does *not* switch back to the original working path.

1+1 port protection architecture

The following figure shows the 1+1 port protection switching architecture.

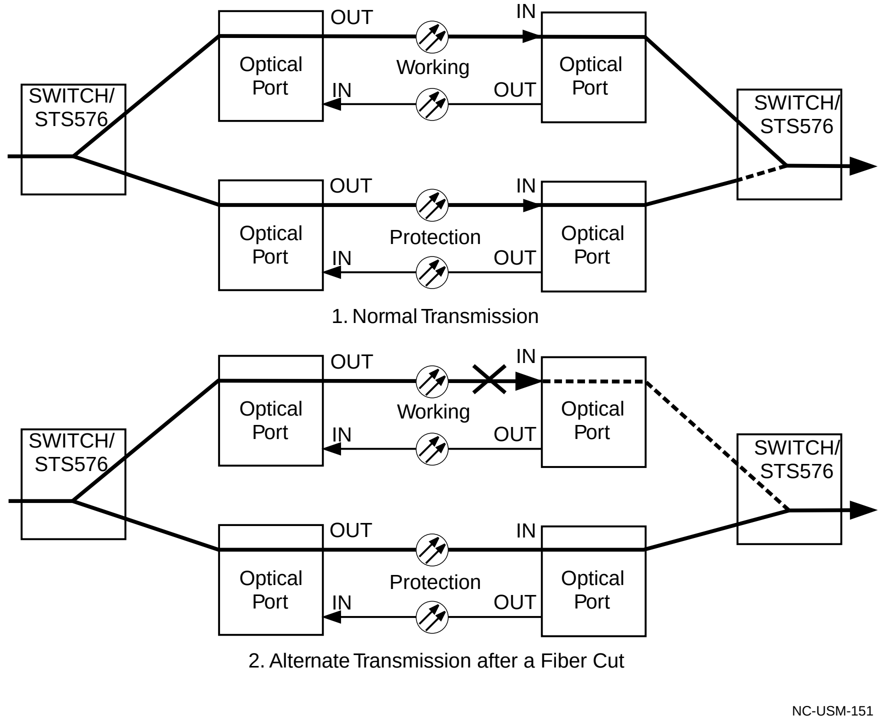


The 1+1 optical port protection switching is performed in the receive (toward the SWITCH/STS576 circuit pack) direction. If the active incoming line fails, the working SWITCH/STS576 circuit pack chooses the line signal from the protection optical port.

In the transmit (toward the optical line) direction, the working SWITCH/STS576 circuit pack bridges the same line signal to the working and protection optical ports.

Optical port protection switching example

The following figure shows an example of unidirectional 1+1 optical port protection switching. (The figure shows one direction of transmission only).



Important! In bidirectional 1+1 optical port protection, protection switching is performed in both directions of transmission simultaneously.

□

1xN DS3EC1/8 Port Unit Protection Switching

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system provides protection for all DS3EC1/8 port units. The DS3EC1/8 port units can be 1xN (N is equal to or less than 12) protected and use bidirectional revertive switching. The 1xN DS3EC1/8 port unit protection switching takes place in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault>Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities

The following table shows the 1xN DS3EC1/8 port unit protection switch priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection	WaveStar CIT/OS
Lockout of Working	WaveStar CIT/OS
Forced Switch	WaveStar CIT/OS
Circuit Pack Failure/Removal	Automatic
Manual Switch	WaveStar CIT/OS
Wait to Restore	Automatic

Port unit priority

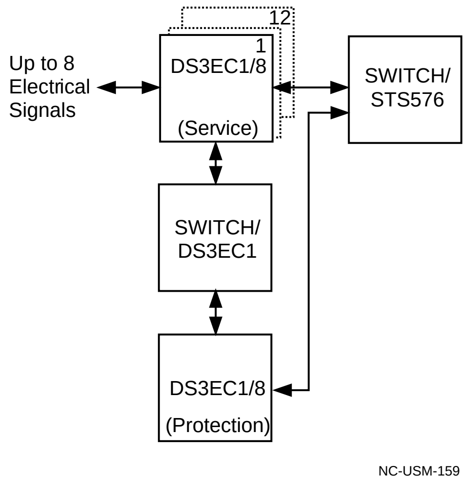
Each I/O Shelf can be equipped with up to 12 service DS3EC1/8 port units and one protection DS3EC1/8 port unit. Each service DS3EC1/8 port unit can be assigned a high or low protection priority. This allows a high priority port unit to preempt any previous switch to protection by a lower priority port unit. Switch requests of equal priority will be met in the order in which they are received. If two requests occur simultaneously, the one with the lower slot address will take priority.

Bidirectional revertive protection switching

Bidirectional refers to protection switching that is performed in the transmit and receive directions simultaneously. The traffic switches from the working DS3EC1/8 port unit to the protection DS3EC1/8 port unit when a port unit fault occurs. In revertive switching, when the fault and the wait-to-restore interval clear, the traffic switches back (reverts) to the working DS3EC1/8 port unit.

1xN DS3EC1/8 port unit protection architecture

The following figure shows the 1xN DS3EC1/8 port unit protection switching architecture.



Operation

If a service DS3EC1/8 port unit fails, the input protection switching relays on the failed DS3EC1/8 port unit route the eight incoming electrical (DS3 and/or EC-1) signals to the SWITCH/DS3EC1 circuit pack. The SWITCH/DS3EC1 circuit pack switches the eight DS3 and/or EC-1 signals to the protection DS3EC1/8 port unit. The working SWITCH/STS576 circuit pack chooses the electrical signals from the protection DS3EC1/8 port unit.

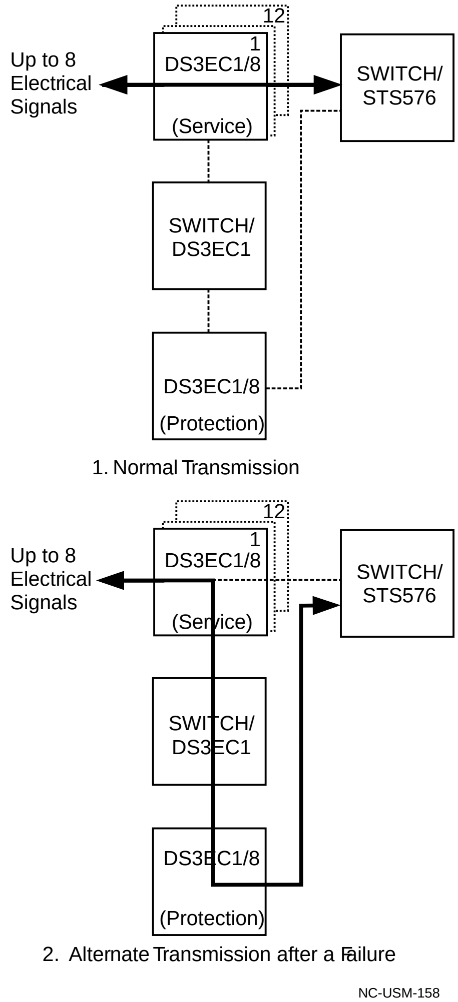
Shorting contacts are provided in the DS3EC1/8 port unit backplane connector so that when the port unit is removed, the cables short through to the SWITCH/DS3EC1 circuit pack for routing to the protection DS3EC1/8 port unit.

In the outgoing direction, the working SWITCH/STS576 circuit pack routes the electrical signals to the protection DS3EC1/8 port unit instead of the failed service DS3EC1/8 port unit. The SWITCH/DS3EC1 circuit pack accepts the eight electrical signals from the protection DS3EC1/8 port unit and routes them to the output protection switching relays on the failed port unit and on to the local cross-connect panel (or equivalent).

The WaveStar TDM 2.5G/10G (2-Fiber) system also supports unprotected DS3EC1/8 port unit operation. The WaveStar TDM 2.5G/10G (2-Fiber) system may be equipped without a protection DS3EC1/8 port unit.

1XN DS3EDC1/8 port unit protection switching example

The following figure shows an example of 1xN DS3EC1/8 port unit protection switching.



Dual Ring Interworking Protection Switching

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system supports dual ring interworking (DRI) protection switching. DRI protection switching protects a circuit with a termination in one ring and the other termination in another ring when an interconnecting node or line fails. DRI protection switching takes place in response to automatically detected failures or external commands from a WaveStar CIT or operations system (OS). For information about the **Fault>Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities

The following table shows the DRI protection switching priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection	WaveStar CIT/OS
Forced Switch	WaveStar CIT/OS
Automatic Path Selector Criteria	Automatic
Manual Switch	WaveStar CIT/OS
Wait to Restore	Automatic

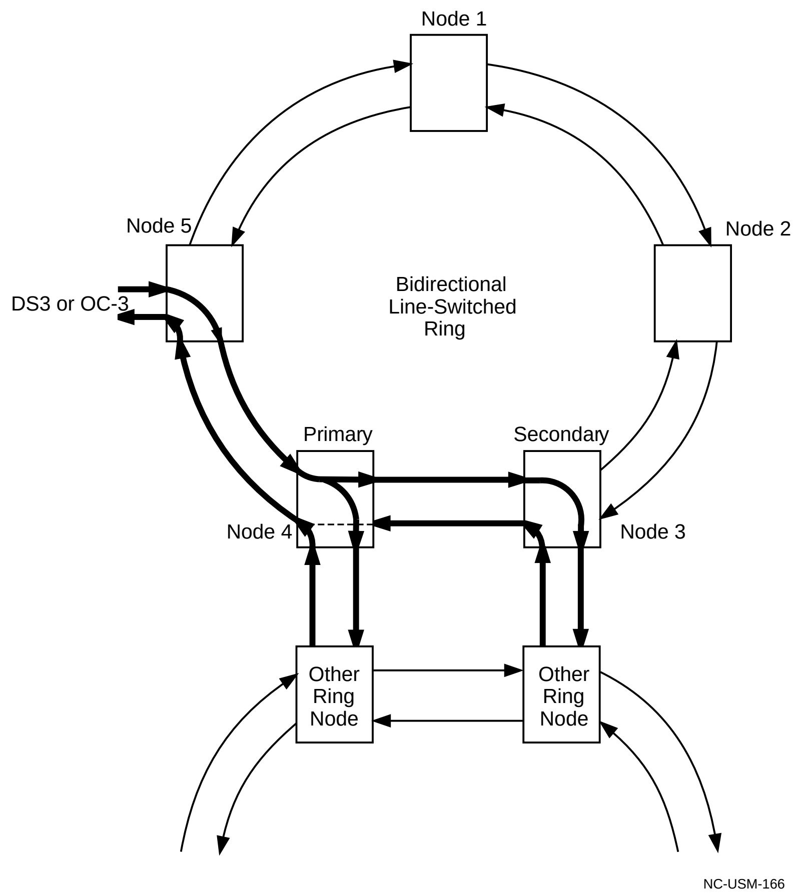
If a higher or equal priority switch request exists, a new switch request is denied.

Unidirectional revertive/ nonrevertive switching

DRI protection switching is unidirectional and revertive or nonrevertive. Unidirectional refers to protection switching that is performed in one direction only. For a given 1-way circuit, DRI protection switching is only performed in the add direction. When a fault occurs, traffic switches from the primary to secondary node. DRI protection switching may be provisioned as revertive or nonrevertive. In nonrevertive switching when the fault clears, traffic does *not* automatically switch back (revert) to the primary node. In revertive switching when the fault clears, traffic does automatically switch back (reverts) to the primary node.

DRI architecture

The following figure shows a DRI application with two rings. One ring is a bidirectional line-switched ring equipped with the WaveStar TDM 2.5G/10G (2-Fiber) system. The other ring could be another line-switched ring equipped with the WaveStar TDM 2.5G/10G (2-Fiber) system or a path-switched ring.



The figure also shows a 2-way DRI circuit. The 2-way DRI circuit is routed to/from the termination node (node 5) in the bidirectional line-switched ring through the primary node (node 4) and secondary node (node 3) to the other ring. (The primary and secondary nodes are not required to be adjacent nodes.)

□

1+1 Equipment Protection Switching

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system provides 1+1 equipment protection for the following circuit packs:

- SWITCH/STS576
- SWITCH/STS768 and PPROC/STS384 (Release 6 and later)
- TMG/STRAT3

The 1+1 equipment protection switching takes place in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault>Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities

The following table shows the 1+1 equipment protection switch priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Priorities (Descending Order)	Source of Request
Clear Forced	WaveStar CIT/OS
Forced Switch (to Side 0 or Side 1)	WaveStar CIT/OS
Circuit Pack Failure/Removal	Automatic
Manual Switch (to Side 0 or Side 1)	WaveStar CIT/OS

If a higher or equal priority switch request exists, a new switch request is denied.

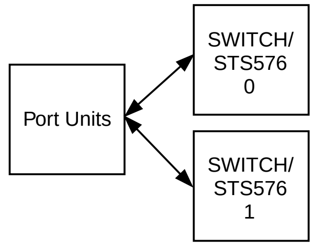
1+1 nonrevertive protection switching

In 1+1 nonrevertive protection switching, the side 0 circuit pack and the side 1 circuit pack interface with the same circuit packs. One side is active (working) and the other side is standby.

When a protection switch occurs, the standby side becomes the new active (working) side. The original active (working) side becomes the standby side. The status remains the same (nonrevertive) after the fault clears.

SWITCH/STS576 circuit pack protection switching architecture

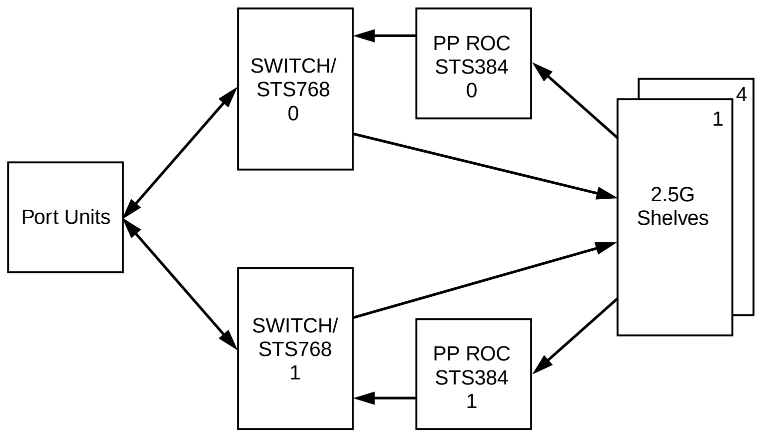
The following figure shows the SWITCH/STS576 circuit pack protection switching architecture.



NC-USM-154

SWITCH/STS768 and PPROC/STS384 circuit pack protection switching architecture

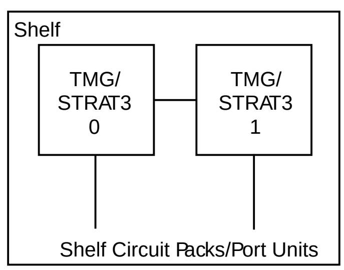
The following figure shows the SWITCH/STS768 and PPROC/ STS384 circuit pack protection switching architecture.



NC-USM-354

TMG/STRAT3 circuit pack protection switching architecture

The following figure shows the TMG/STRAT3 circuit pack protection switching architecture.



NC-USM-156

Synchronization Reference Protection Switching

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system provides protection for all system synchronization references. Synchronization reference protection switching occurs in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault>Timing/Sync Protection Switch>System Timing Reference Switch** command, refer to the online help available with the WaveStar CIT.

Switch request priorities

The following table shows the synchronization reference protection switch priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Types	Source of Request
Clear Reference Switch	WaveStar CIT/OS
Lockout	WaveStar CIT/OS
Forced Switch	WaveStar CIT/OS
Reference Failure	Automatic
Manual Switch	WaveStar CIT/OS
Wait to Restore (Revertive only)	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Timing References

In the locked timing mode, the WaveStar TDM 2.5G/10G (2-Fiber) system derives timing from up to two external DS1 references (EXTREF1 and EXTREF2) and one OC-48 or OC-192 line reference (LINE1). In Release 5 and later releases, the WaveStar TDM 2.5G/10G (2-Fiber) system derives timing from up to two external DS1 references (EXTREF1 and EXTREF2) and up to six OC-3, OC-12, OC-48, or OC-192 line references (LINE1 through LINE6).

If OC-3 and OC-12 line references are used, the port units must be in even-numbered slots and the first port must be used.

In Release 5 and later releases, each timing reference is assigned a:

- System Timing Reference Priority (for example, 1, 2, or 3)
- Quality level (for example PRS, STU, ST2, ST3), if the System SSM Mode parameter is Enabled

In releases prior to Release 5, each timing reference is assigned a System Timing Reference Priority only.

Revertive/nonrevertive switching (releases prior to Release 5)

In releases prior to Release 5, the system supports revertive or nonrevertive synchronization reference protection switching based on the System Timing Reference Priority parameter. If the System Timing Reference Priority parameter is provisioned with the same value for each timing reference, timing reference protection is nonrevertive. For example, the System Timing Reference Priority parameter of each timing reference is provisioned as 1 for nonrevertive operation. (See the following example.)

If the System TIming Reference Priority parameter is provisioned with different values, timing reference protection is revertive. For example, the System Timing Reference Priority parameters for the timing references are provisioned 1, 2, 3, and 4, respectively, for revertive operation. The value 1 is the highest priority and 4 is the lowest priority. (See the following example.)

Example of timing reference priorities and switching operation

> **Important!** In Release 5 and later releases, up to 6 lines references are supported.

The following table shows an example of timing reference priorities and switching operation.

Type of Switching	System Timing Reference Priority							
	EXTREF1	EXTREF2	LINE1	LINE2	LINE3	LINE4	LINE5	LINE6
Nonrevertive	1	1	1	1	1	1	1	1
Revertive (Recommended Priorities)	1 (highest)	2	3	4	5	6	7	8

Revertive/nonrevertive switching (Release 5 and later)

In Release 5 and later releases, the system supports revertive or nonrevertive synchronization reference protection switching based on the System SSM (Synchronization Status Message) Mode parameter, Quality Levels, and the System Timing Reference Priority parameter.

System SSM Mode Enabled

If the System SSM Mode parameter is Enabled, the system uses the Quality Levels associated with each timing reference (for example, PRS, STU, ST2, ST3) to determine the active timing reference. If the Quality Level is the same value for each timing reference, timing reference protection is nonrevertive. For example the Quality Level of each timing reference is STU.

If the Quality Level of the timing references have different values, timing reference protection is revertive. For example, the Quality Levels associated with the timing references are PRS, STU, ST2, ST3, respectively.

See the following table for a list of Synchronization Status Messages and Quality Levels.

Synchronization Status Message	Description	Quality Level
PRS	Stratum 1 Traceable	1 (highest)
STU	Synchronized - Traceability Unknown	2
ST2	Stratum 2 Traceable	3
ST3	Stratum 3 Traceable	4
ST4	Stratum 4 Traceable	5
DUS	Don’t Use for Synchronization	6 (lowest)

Important! The WaveStar TDM 2.5G/10G (2-Fiber) system does not accept provisioning Quality Levels lower than ST3.

If the WaveStar TDM 2.5G/10G (2-Fiber) system derives timing from an incoming OC-3, OC-12, OC-48, or OC-192 signal, the Quality Level of the outgoing signal is DUS.

System SSM Mode Disabled

If the System SSM Mode is Disabled, the system uses the System Timing Reference Priority parameter associated with each timing reference (for example 1, 2, 3) to determine the active timing reference. Refer to the “Revertive/nonrevertive switching (releases prior to Release 5)” for a description of revertive/nonrevertive switching using the System Timing Reference Priority parameter.

Operation (releases prior to Release 5)

If the active timing reference fails, the system selects the available timing reference with the highest provisioned System TIming Reference Priority as the active timing reference.

If more than one available timing reference has the same provisioned System TIming Reference Priority, the system selects the active timing reference according to the following (in descending order):

- EXTREF1 (Priority 1 - highest)
- EXTREF2 (Priority 2)
- LINE1 (Priority 3)

If there are no available timing references, the system performs a synchronization mode switch and enters the holdover mode.

Operation (Release 5 and later)

In Release 5 and later releases, synchronization reference protection switching is affected by the provisioned value (Enabled or Disabled) of the System SSM Mode parameter.

System SSM Mode Enabled

If the active timing reference fails and the System SSM Mode is Enabled, the system selects the available timing reference with the highest Quality Level as the active timing reference.

If more than one available timing reference has the same Quality Level, the system selects the available timing reference with the highest provisioned System TIming Reference Priority as the active timing reference.

If more than one available timing reference has the same provisioned System TIming Reference Priority, the system selects the active timing reference according to the following (in descending order):

- EXTREF1 (highest priority)
- EXTREF2
- LINE1
- LINE2
- LINE3
- LINE4
- LINE5
- LINE6 (lowest priority

If there are no available timing references, the system performs a synchronization mode switch and enters the holdover mode.

System SSM Mode Disabled

If the active timing reference fails and the System SSM Mode is Disabled, the system selects the available timing reference with the highest provisioned System TIming Reference Priority as the active timing reference.

If more than one available timing reference has the same provisioned System TIming Reference Priority, the system selects the active timing reference according to the following (in descending order):

- EXTREF1 (highest priority)
- EXTREF2
- LINE1
- LINE2
- LINE3
- LINE4
- LINE5
- LINE6 (lowest priority

If there are no available timing references, the system performs a synchronization mode switch and enters the holdover mode.

□

Synchronization Mode Protection Switching

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system provides synchronization mode protection. Synchronization mode protection switching occurs in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For information about the **Fault>Timing/Sync Protection Switch>Clock Mode Switch** command, refer to the online help available with the WaveStar CIT.

Switch request priorities

The following table shows the synchronization mode protection switch priorities (in descending order of priority) used by the WaveStar TDM 2.5G/10G (2-Fiber) system.

Switch Priorities (Descending Order)	Source of Request
Clear Mode Switch	WaveStar CIT/OS
Force Switch to Holdover	WaveStar CIT/OS
Synchronization Reference Failure (Automatic Switch to Holdover)	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Operation

If the WaveStar TDM 2.5G/10G (2-Fiber) system is provisioned to operate in the locked timing mode and all timing reference signals fail or unavailable, the TMG/STRAT3 circuit packs switch to the holdover mode. The holdover mode is entered when the integrity of the reference signal is considered unacceptable, or by manual command. In the holdover mode, the on-board oscillator frequency will not degrade below the stratum 3 level. When the fault clears, the TMG/STRAT3 circuit packs switch back (revert) to the locked mode.

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Loopbacks

Introduction

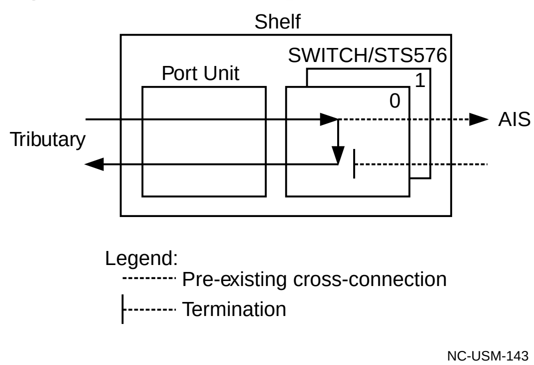
The WaveStar TDM 2.5G/10G (2-Fiber) system provides the following types of loopbacks:

- Cross-connect loopbacks
- Nearside facility loopbacks (Release 5 and later)
- Farside facility loopbacks (Release 5 and later)
- Optical loopbacks

Cross-connect loopbacks

Cross-connect loopbacks allow an input tributary to be looped back in the shelf SWITCH/STS576 or SWITCH/STS768 circuit packs to the output of the same tributary.

The following figure shows an example of a cross-connect loopback.



Cross-connect loopbacks are allowed on any tributary regardless of whether there is an existing cross-connection to the selected tributary. If a cross-connection exists on the selected tributary, an alarm indication signal (AIS) is inserted downstream during the loopback. If a cross-connection exists in the opposite direction, the signal is terminated during the loopback. When the cross-connect loopback is released, any pre-existing cross-connections are automatically reestablished.

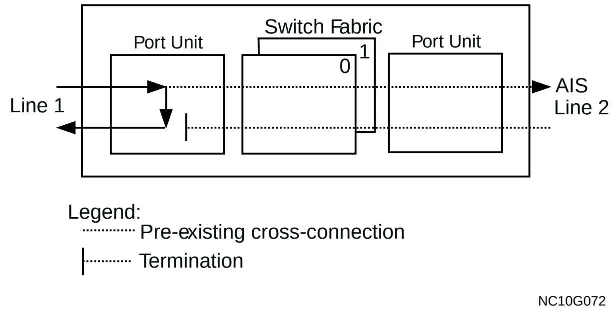
Active cross-connect loopbacks are noted by the abnormal (ABN) LED on the user panel and the WaveStar CIT.

Cross-connect loopbacks are made and released in response to the **Fault>Analysis>Cross Connect Loopback** command entered at the WaveStar CIT or operations system. For more information about the **Fault>Analysis>Cross Connect Loopback** command, refer to the online help available with WaveStar CIT.

Nearside facility loopbacks

Nearside facility loopbacks allow an incoming DS3, EC1, OC-3, OC-12, or OC-48 line to be looped back in the port unit to the output of the same line.

The following figure shows an example of a nearside facility loopback.



Nearside facility loopbacks are allowed on any incoming DS3, EC1, OC-3, OC-12, or OC-48 line regardless of whether there is an existing cross-connection(s) established to tributaries associated with the port. If a cross-connection exists on a tributary associated with the port, an alarm indication signal (AIS) is inserted downstream during the loopback. If a cross-connection exists in the opposite direction, the signal is terminated during the loopback. When the nearside facility loopback is released, any pre-existing cross-connections are automatically reestablished.

Nearside facility loopbacks are not allowed on a port that has an active farside facility loopback.

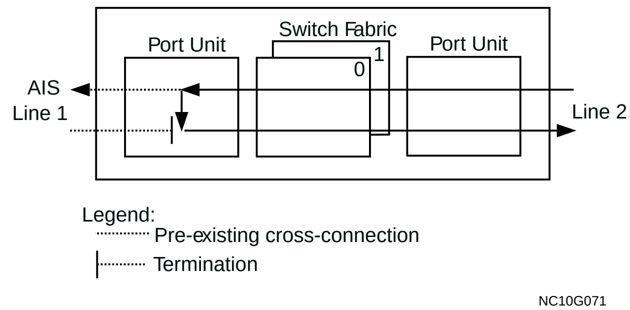
Active nearside facility loopbacks are reported by the abnormal (ABN) LED on the user panel and the WaveStar CIT.

Nearside facility loopbacks are established and released in response to the **Fault>Analysis>Facility Loopback** command entered at the WaveStar CIT or operations system. For more information about the **Fault>Analysis>Facility Loopback** command, refer to the online help available with WaveStar CIT.

Farside facility loopbacks

Farside facility loopbacks allow an outgoing DS3, EC1, OC-3, OC-12, or OC-48 line to looped back in the port unit to the switch fabric and the outgoing line in the opposite direction.

The following figure shows an example of a farside facility loopback.



Farside facility loopbacks are allowed on any DS3, EC1, OC-3, OC-12, or OC-48 line regardless of whether there is an existing cross-connection(s) established to tributaries associated with the port. If a cross-connection exists on a tributary associated with the port, an alarm indication signal (AIS) is inserted downstream during the loopback. When the farside facility loopback is released, any pre-existing cross-connections are automatically reestablished.

The following restrictions apply to farside facility loopbacks:

- Farside facility loopbacks are not allowed on a port that has an active nearside facility loopback.
- All the tributaries looped back must come from the same port.
- The line rate of the port that is looped back must not exceed the line rate of the outgoing port. For example in the above figure, if Line 2 is an OC-12 line, Line 1 must not exceed the OC-12 line rate.

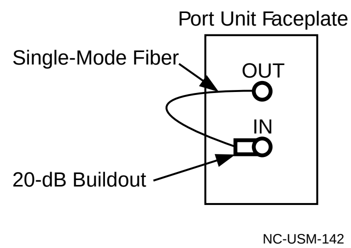
Active farside facility loopbacks are reported by the abnormal (ABN) LED on the user panel and the WaveStar CIT.

Farside facility loopbacks are established and released in response to the **Fault>Analysis>Facility Loopback** command entered at the WaveStar CIT or operations system. For more information about the **Fault>Analysis>Facility Loopback** command, refer to the online help available with WaveStar CIT.

Optical loopbacks

The WaveStar TDM 2.5G/10G (2-Fiber) system allows manual loopbacks to be performed on all optical interfaces. Front access to the optical connectors on the port unit faceplates allows manual optical loopbacks. This loopback is performed by connecting the OUT optical connector on the faceplate of a port unit to the IN optical connector on the same port unit with a single-mode fiber jumper and lightguide buildouts.

The following figure shows the optical loopback connections.



Tests

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system provides the following self tests:

- LED test
- Office alarms test

LED test

The LED test verifies that the user panel and circuit pack faceplate LEDs are operating properly in a shelf. The test consists of one or more test iterations (cycles) repeated as many times as specified.

In each test iteration (cycle) the user panel LEDs and circuit pack faceplate LEDs are lighted for 2 seconds and turned off for 2 seconds. This repeats three times for each test iteration (cycle) specified. The PWR ON LED is always on if the shelf is powered and cannot be tested.

The LEDs revert to normal operation after the LED test is completed.

The LED test is performed using the LED test push button on the user panel or the **Fault>Test>LED...** command. For more information about the user panel and the LED test push button, refer to 365-371-210, WaveStar TDM 2.5G/10G (2-Fiber) User Operations Guide. For more information about the **Fault>Test>LED...** command, refer to the online help available with the WaveStar CIT.

Office alarms test

The office alarms test verifies that the shelf audible/visible office alarm outputs and the corresponding LEDs on the user panel are operating properly. The test consists of one or more test iterations (cycles) repeated as many times as specified.

In each test iteration (cycle) the office audible/visible office alarm outputs and the corresponding user panel LEDs turn on for 5 seconds each in the following order:

- Critical
- Major
- Minor

The office alarms revert to normal operation after the test is completed. The office alarms test is performed using the **Fault>Test>Office Alarm...** command. For more information about the **Fault>Test>Office Alarm...** command, refer to the online help available with the WaveStar CIT.

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Reports

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system provides the following reports:

- Equipment Lists
- Status Lists
- Cross-Connection List
- Data List (Release 5)
- NE Alarm List
- BLSR Protection Switch List

Reports provide information about parameters for a range of equipment. For example, a report may show the parameters for all the transmission ports on a shelf.

Equipment Lists

The Equipment Lists reports show the current state of provisionable parameters for shelves, circuit packs, ports, virtual container groups (VCGs) and tributaries. The following commands are used to obtain Equipment Lists reports:

- **Reports>Equipment Lists>Shelf...**
- **Reports>Equipment Lists>Pack...**
- **Reports>Equipment Lists>Port...**
- **Reports>Equipment Lists>VCG...** (Release 5 and later)
- **Reports>Equipment Lists>Trib...**
- **Reports>Equipment Lists>Miscellaneous Discretes...** (Release 5 and later)

For more information about these reports, refer to the online help available with the WaveStar CIT.

Status Lists

The Status Lists reports show status information (for example, alarms, states, and fault information) for shelves, circuit packs, and ports. The following commands are used to obtain Status Lists reports:

- **Reports>Status Lists>Shelf...**
- **Reports>Status Lists>Pack...**
- **Reports>Status Lists>Port...**
- **Reports>Status Lists>Trib...**

For more information about these reports, refer to the online help available with the WaveStar CIT.

Cross-Connection List

The Cross-Connection List report shows the cross-connections on a shelf, circuit pack, port, port protection group, or ring. The **Reports>Cross-Connection List...** command is used to obtain a Cross-Connection List report. For more information, refer to the online help available with the WaveStar CIT.

Data List

The Data List report shows detailed information about all provisioned virtual local area networks (VLANs) on a shelf. The **Reports>Data List...** command is used to obtain a Data List report. For more information, refer to the online help available with the WaveStar CIT.

NE Alarm List

The NE Alarm List report shows detailed information about the current alarms on the network element. The **Reports>NE Alarm List...** command is used to obtain an NE Alarm List report. For more information, refer to the online help available with the WaveStar CIT.

BLSR Protection Switch List

The BLSR Protection Switch List report shows the BLSR protection switches on a shelf. The **Reports>BLSR Protection Switch List...** command is used to obtain a BLSR Protection Switch List report. For more information, refer to the online help available with the WaveStar CIT.

Logs

Introduction

The WaveStar TDM 2.5G/10G (2-Fiber) system maintains the following activity logs:

- NE Alarm Log
- NE Protection Switch Activity Log
- NE User Log
- NE Security Log
- NE Notification Log

Logs are used to display history data that is maintained in the network element (NE) database.

NE Alarm Log

The NE Alarm Log shows the last 512 alarm notifications at the network element. The **Reports>NE Alarm Log...** command is used to obtain an NE Alarm Log. For more information, refer to the online help available with the WaveStar CIT.

NE Protection Switch Activity Log

The NE Protection Switch Activity Log shows a list of the previous manual and automatic protection switches. The **Reports>NE Protection Switch Activity Log...** command is used to obtain an NE Protection Switch Activity Log. For more information, refer to the online help available with the WaveStar CIT.

NE User Log

The NE User Log shows a list of the previous executed commands. The **Reports>NE User Log...** command is used to obtain an NE User Log. For more information, refer to the online help available with the WaveStar CIT.

NE Security Log

The NE Security Log shows a list of all the logins/logouts. The **Reports>NE Security Log...** command is used to obtain an NE Security Log. For more information, refer to the online help available with the WaveStar CIT.

NE Notification Log

The NE Notification Log shows a list of all changes (manual and automatic) to the database. The **Reports>NE Notification Log...** command is used to obtain an NE Notification Log. For more information, refer to the online help available with the WaveStar CIT.

□

Summary

Introduction

This chapter defines the maintenance philosophy and describes the features available to monitor and maintain the WaveStar TDM 2.5G/10G (2-Fiber) system.

Maintenance philosophy

The WaveStar TDM 2.5G/10G (2-Fiber) system allows operation and maintenance of network elements in a network from a centralized location. The WaveStar TDM 2.5G/10G (2-Fiber) system continuously monitors equipment and incoming signals, and reports any current or potential troubles. This enables the user to take the appropriate corrective action. The WaveStar TDM 2.5G/10G (2-Fiber) system supports proactive and reactive system maintenance.

Maintenance signals

When the WaveStar TDM 2.5G/10G (2-Fiber) system detects failure conditions on transmission signals, maintenance signals are inserted into the transmission signals in the upstream or downstream direction to notify other network elements. The WaveStar TDM 2.5G/10G (2-Fiber) system supports the following maintenance signals:

- Alarm indication signals (AIS)
- Remote defect indication (RDI) signals
- Remote error indication (REI) signals
- Path trace signals
- Section trace signals (Release 5 and later)
- Path unequipped signals
- DS3 idle signals
- Payload defect indicator signals

Fault detection, isolation, and reporting

The WaveStar TDM 2.5G/10G (2-Fiber) system continuously monitors its internal condition and incoming signals according to the state of the tributaries and ports. When a failure is detected, the WaveStar TDM 2.5G/10G (2-Fiber) system employs automatic diagnostics to isolate the failed circuit pack or signal. All failures detected and isolated by the WaveStar TDM 2.5G/10G (2-Fiber) system are stored and made available to be reported, on demand, through the WaveStar CIT.

Protection switching

The WaveStar TDM 2.5G/10G (2-Fiber) system supports the following types of protection switching:

- 2-fiber bidirectional line-switched ring protection switching
- Unidirectional path-switched ring protection switching (Release 5 and later)
- 1+1 optical port protection switching
- 1xN DS3EC1/8 port unit protection switching
- Dual ring interworking (DRI) protection switching
- 1+1 equipment protection switching
- Synchronization reference protection switching
- Synchronization mode protection switching

Loopbacks

The WaveStar TDM 2.5G/10G (2-Fiber) system provides the following types of loopbacks:

- Cross-connect loopbacks
- Nearside facility loopbacks (Release 5 and later)
- Farside facility loopbacks (Release 5 and later)
- Optical loopbacks

Tests

The WaveStar TDM 2.5G/10G (2-Fiber) system provides the following self tests:

- LED test
- Office alarms test

Reports

The WaveStar TDM 2.5G/10G (2-Fiber) system provides the following reports:

- Equipment Lists
- Status Lists
- Cross-Connection List
- Data List (Release 5)
- NE Alarm List
- BLSR Protection Switch List

Reports provide information about parameters for a range of equipment. For example, a report may show the parameters for all the transmission ports on a shelf.

Logs The WaveStar TDM 2.5G/10G (2-Fiber) system maintains the following activity logs:

- NE Alarm Log
- NE Protection Switch Activity Log
- NE User Log
- NE Security Log
- NE Notification Log

Logs are used to display history data that is maintained in the network element database.

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Part III

Trouble-Clearing Tasks

Task 500: Alarms and Applicable Trouble-Clearing Task(s)

☐

Probable Cause	Description	Trouble Clearing Task ID
AGNECF	AGNE Communications Failure	
AIS	Alarm Indication Signal – DS3	Not Applicable
AIS-L	Alarm Indication Signal – Line	Not Applicable
AIS-P	Alarm Indication Signal – Path	
ALS	Automatic Laser Shutdown	T 572
ANM	Auto Negotiation Mismatch	
APSB	Protection Switch Byte Failure	
APSC	BLSR Inconsistent APS Codes	T 524
APSCM	APS Channel Mismatch	
APSFOP	APS Failure of Protocol	Not Applicable
APSMM	APS Mode Mismatch	
APSPAI	APS Port Assignment Invalid	
APSPROV	BLSR Improper APS Codes	T 525
BLKSW	Potential Blocking Core Switch	
BLSR-DKB	BLSR Ring-Default K-bytes	T 526
CBITMM	C-bit Mismatch	T 576
CFOPR	VCG Failure of Protocol Rx	
CFOPT	VCG Failure of Protocol Tx	
CKTAUDSNP	Ring Ckt Validation Suspended	
CKTAUDUD	Ring Circuit Audit Suppressed	
CLKOUTQF	Clock-Out Quality Failure	
CLOPC	VCG Loss of Partial Capacity	
CLOTC	VCG Loss of Total Capacity	
CPUNAV	Circuit Pack Unavailable	

Probable Cause	Description	Trouble Clearing Task ID
CPUNAV	Cable Diagnostic Failure	
DCCLD	DCC Line Disabled-Unavailable	T 517
DCCPR	DCC Partition Repair	
DCCSD	DCC Sect Disabled-Unavailable	T 517
DCCTM	DCC Tunnel Mismatch	
DCCTO	DCC Tunnel Overflow	
DUPL-RNG	Duplicate Ring Node	T 529
EOC	DCC Sect Disabled-Unavailable	T 517
EOC	DCC Sect Failure	T 514
EOC	DCC Type Mismatch	
EOC	LinkID Sect Mismatch	
EOC	User-Network Side Sect Failure	T 516
FAILTOSW	Path Switch Failure	
FEPRLF	APS Far-End Protection Line Failure	
GFPLOF	VCG - Loss of Frame Delineation	
HLDOVRSYNC	System Clock Holdover	T 519
IMPGF	Improper Growth Switch CP out of order	
ISD	DS3 Idle Signal	
LANANM	Ethernet Port - Auto Negotiation Mismatch	
LAS	Line Automatic Switch	
LOA	VCG - Loss of Alignment	T 574
LOF	DS3 Loss of Frame	T 545
LOF	Loss of Frame	T 545
LOM	VCG - Loss of Multiframe	T 571
LOP-P	Loss of Pointer – Path	T 512
LOS	DS3 Loss of Signal	T 543
LOS	Loss of Signal	T 543
MAN	Constituent Signal Rate Change	

Probable Cause	Description	Trouble Clearing Task ID
MAN	Intruder Alert	Not Applicable
NID-CONFL	Node ID Mismatch	
NUTNOPR	Local NUT Not Operational	
NUTINXCGRN	NUT Inconsistent XC Granularity	
NUTDSBLD	NUT Disabled	
NUTTMPPROV	Temporary NUT Provisioned	
OSILINKERR	DCC Line Disabled-Unavailable	T 517
OSILINKERR	DCC Line Failure	
OSILINKERR	LinkID Line Mismatch	
OSILINKERR	User-Network Side Line Failure	T 516
OVRDSW	Ring Protection Switching Suspended	T 520
PAINTGRT	Path Integrity Failure	T 511
PAPRVERR	Circuit Provisioning Error	
PDI-P	STS Payload Defect Indicator	T 512
PLOS	Pulsed Loss of Signal	
PSA	Path Switch Active	
PSF	Path Switch Failure	
PSI	Path Switch Inhibited	
PLM-P	STS Payload Label Mismatch	
RFI-L	Remote Failure Indication – Line	Not Applicable
RFI-P	Remote Failure Indication – Path	T 512
RNG-CERR	East/West - Cable Error	
RNG-DSCVY	Ring Discovery In Progress	Not Applicable
RNG-INC	Ring Incomplete	T 531
RNG-INITC	Ring Startup in Progress	
RNG-PREEMPT	Extra Traffic Pre-empted	
RNG-SQUELCH	Ring Traffic Squelched	
RNG-URT	Unknown Ring Type	
SCHLD	System Clock Holdover	

Probable Cause	Description	Trouble Clearing Task ID
SIAC	System in Abnormal Mismatch	
SQM	Sequence Number Mismatch	
SQMAP-CONFL	Local Squelch Map Conflict	T 573
SQMAP-INCST	Ring Squelch Map Inconsistent	
SRM-P	Signal Rate Mismatch – Path	
SSF	System Startup/Initialization Failure	
SUPACC	User Panel Access Failure	
SYNC	Line Sync Reference Failure	T 570
SYNC	Sync Reference Failure	T 513
SYNCSTATCHNG	System Timing Quality Level Change	
T-BERL	DS3 Bit Error Rate	T 521
T-BERL	Excessive Bit Error Rate-Line	T 521
T-BERL	Bit Error Rate – Signal Degrade Line	T 521
T-BERP	Bit Error Rate/ Signal Degrade – Path	
T-BERP	Excessive Bit Error Rate – Path	
UNEQ-P	STS Path Unequipped	T 512
UNSLF	User-Network Side Line Failure	
UNSSF	User-Network Side Sect Failure	
VCGSF	VCG - Signal Fail	
AGNECF	AGNE Communications Failure	
ALS	Automatic Laser Shutdown	T 572
EQPT	Circuit Pack Failure	
	CTLEI	T 554
	CTLMEM	T 553
	DS3EC1/8	T 547
	OC3STM1	T 550

Probable Cause	Description	Trouble Clearing Task ID
	OC12STM4	T 549
	OC48STM64	T 548
	OC192STM64	T 564
	Pointer Processor	T 567
	SWITCH576	T 559
	SWITCH768	T 563
	SWITCHDS3EC1/8	T 562
	SYS50DM	T 552
	TMGSTRAT3	T 560
INIT-1	Startup/ Initialization Complete	
INT	Fan Failure	T 504
PRCDRERR	Circuit Pack Invalid	T 535
PWR	Power/Fuse Failure	T 506
RCVRY	System in Restoration Mode	
REPLUNITMISS	Circuit Pack Unequipped/ Missing	T 533
REPLUNITMISS	Mate Circuit Pack Unequipped	T 534
SCMMA	System in Maintenance Condition	Not Applicable
SYSBOOT	System Restart	
TSA	Alarm Test	Not Applicable
UPGRDF	Upgrade Failed	
T-{modifiertype}	Threshold Crossing Alert – DS3 Incoming	
T-{modifier type}	Threshold Crossing Alert – DS3 Outgoing	
T-{modifiertype}	Threshold Crossing Alert – Path Layer	
T-{modifiertype}	Threshold Crossing Alert – Physical Layer	
T-{modifiertype}	Threshold Crossing Alert –Section/Line or RS/MS layer	

Probable Cause	Description	Trouble Clearing Task ID
AUTORESET	Autonomous Reset	Not Applicable
BKUPMEMO	Non-Volatile Memory Usage	Not Applicable
DATAFLT	Memory Mismatch	Not Applicable
PROGFLT	File Error	Not Applicable
PROCROVLD-1	Resource Usage	Not Applicable
SFT	Software Error, Fatal	Not Applicable
WKGMEM	Out of Memory Error	
MISC	Miscellaneous Discretes	T 507

Task 504: Clear ‘Fan Failure’ in a WaveStar TDM 2.5G (OC-48)/10G (OC-192) (2-Fiber) Shelf

Purpose

The *Fan Failure* alarm can occur as the result of several factors. Use this procedure to determine the exact cause of the alarm and to replace the failed hardware component, thus clearing this alarm.

Required equipment

Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap

Safety precautions

To assure both personal safety and the proper functioning of the WaveStar TDM 2.5G(OC-48)/10G (OC-192) (4-Fiber) system, it is imperative to review and understand these warnings and precautions prior to performing this task.

CAUTION

Removal of the active STS576 circuit pack will result in a service interruption.

Related information

For related information, see:

- *Maintenance and Trouble Clearing* descriptive chapter
- Task 506: Clear ‘Power/Fuse Failure’ for a WaveStar TDM 2.5G/ 10GShelf
- Replace Fan Filter (Task 207) every 6 months
- Replace Fan Unit (Task 709)

Before you begin

Prior to beginning this task, you must:

- Have quick access to a new (uninstalled) fan unit.
- Have quick access to a new (uninstalled) fan filter.
- Have quick access to a new STS576 circuit pack.
- Have quick access to a new power filter.
- Have a WaveStar CIT that is connected to the subject network element (NE).

- Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.

Do the following as appropriate:

- Have the on-site craft remove the front shelf cover.
- Have the on-site craft turn off the audible alarm by pressing the **ACO** button, which is located on the front of the user panel.

Task Complete the following steps to clear a *Fan Failure* alarm.

1 From the WaveStar CIT *System View* screen, click on the **Alarm List** button.

> **Important!** Under the column header that is labeled *Description*, you will see the names for each active alarm, its associated alarm level, affect on service, and so forth. Some alarms have multiple probable causes and may have more than one alarm level; for example, either an MJ or MN.

2 Under the column header *Description* and for the item *Fan Failure*, "Is the Alarm Level = MJ?"

If…	Then…
YES, *NOTE:* When the Alarm Level = MJ, either: (a) the fan unit internal controller has failed, or (b) multiple fans have failed – resulting in the remaining fans operating in high-speed mode.	go to Step 7.
NO,	the Alarm Level must = MN. Continue with Step 3.

3 Under the column header *Description*, “Is the alarm *Power/Fuse Failure* included in the list?”

If…	Then…
YES,	refer to the Task 506: Clear ‘Power/ Fuse Failure’ for a WaveStar TDM 2.5G/ 10GShelf.
NO,	Continue with the next step.

4 On the subject NE Fan Unit, visually determine whether the LED *Filter Alarm* is lighted.

If…	Then…
YES,	go to Step 23.
NO,	the LED *Fail* must be lighted. Continue with the next step. **Important!** The probable causes are: (a) single fan failure—with other fans operating in high speed mode, or (b) the control circuit that is located within the fan unit.

5 On the faceplate of the fan unit, “Is the fan unit circuit breaker –48V (A) or –48V (B) tripped?”

If…	Then…
YES,	reset the tripped circuit breaker.
NO,	go to Step 7.

6 Did the circuit breaker trip again?

If…	Then…
YES,	go to Step 7.
NO,	*STOP! End of Task.*

7 Replace the fan unit.

Reference: Task 709: Replace Fan Unit

8 Wait 30 seconds, and then at the WaveStar CIT, click on the **Update Alarms** button.

9 Under the column header **Description** and for the item **Fan Failure**, "Did the Alarm Level = MJ/MN reoccur?"

If…	Then…
YES,	continue with Step 10.
NO,	*STOP! End of Task.*

10 Remove the new fan unit, and insert the original fan unit.

Reference: Task 709: Replace Fan Unit

11 Determine which of the two STS576 circuit packs is active and which is in hot-standby.

Important! The on-site craft can visually determine status (active versus hot-standby) by checking the state of the green LED on the circuit pack faceplate. The circuit pack that is currently handling traffic (active) will have a steady-green lighted LED. The alternate circuit pack's LED (the one in hot-standby) will not be lighted.

Alternately, and at the WaveStar CIT, status of the STS576 circuit packs can be determined by displaying the shelf and right-clicking on the drop-down **view details** for the subject circuit pack.

12 Unlatch and, only partially, pull from the slot the STS576 circuit pack whose LED is NOT lighted steady-green.

13 Wait 30 seconds, and after that lapse of time, at the WaveStar CIT click on the **Update Alarms** button.

14 Under the column header **Description** and for the item **Fan Failure**, “Did the Alarm Level = MJ/MN clear?”

If…	Then…
YES,	continue with Step 21.
NO,	continue with Step 15.

15 Reinsert the STS576 circuit pack that is partially removed. Wait 30 seconds for the circuit pack to reinitialize.

16 At the WaveStar CIT, and from the *System View*, select *Fault-Protection Switching*.

17 Click on the tab labeled **Protection**.

18 In the root directory, scroll down and click on the item that is labeled **1+1 Equipment ests576grp**.

Important! In the *Protection Group* window you want to cause the side whose status is *hot-standby* to become the active side.

19 For the box that is labeled **Switch Type**, click on the drop-down arrow, and (as appropriate) select the entry **Force to Side 0** or **Force to Side 1**.

Click on the button that is labeled **Apply**.

20

1. The on-site craft should verify that the switch occurred by observing the status of the green LED on each of the two STS576 circuit packs.

2. Unlatch and fully remove the alternate STS576 circuit pack (whose LED is NOT lighted steady-green).
3. Insert a new STS576 circuit pack and fully close its latch.
4. *STOP! End of Task.*

---

21 For the STS576 circuit pack that is partially removed, finish removing it and replace it with a new STS576 circuit pack.

---

22 *STOP! End of Task.*

---

23 Remove the existing fan filter and insert a new fan filter.

---

24 Press the **Filter Alarm Reset** button (which is located on the front of the fan unit).

---

25 Wait 6 minutes, and then at the WaveStar CIT, click on the **Update Alarms** button.

---

26 Under the column header **Description**, "Did the alarm *Fan Failure* reoccur?"

If…	Then…
YES,	continue with Step 27.
NO,	STOP! End of Task.

---

27 If the original filter is relatively clean, remove the new filter and reinsert the original filter.

Reference: Task 207: Replace Fan Filter

28 Go to Step 7.

ND OF STEPS

Task 506: Clear ‘Power/Fuse Failure’ for a WaveStar TDM 2.5G/ 10GShelf

Purpose

The *Power/Fuse Failure* alarm can occur as the result of several factors. Use this procedure to determine the exact cause, reset circuit breakers, replace the failed hardware component, and thus clear this alarm.

Required equipment

The following list is the minimum set of required equipment:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap
- Digital volt meter (DVM) or equivalent.

Related information

For related information, see the following:

- *Chapter 2, Maintenance and Trouble Clearing* descriptive chapter
- Task 706: Replace a Defective Power Filter

Before you begin

Before you begin this task, you must:

- Have a WaveStar CIT that is connected to the subject network element (NE).
- Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.

Do the following as appropriate:

- Remove the front shelf cover.
- When activated, turn off the audible alarm by pressing the **ACO** button, which is located on the front of the user panel.

Task

Complete the following steps to clear a Power/Fuse Failure for any WaveStar TDM 2.5G (OC-48)/10G (OC-192) (2-Fiber) shelf.

1 From the WaveStar CIT *System View*, left-click on the **Alarm List** button.

Important! Under the column header that is labeled *Description*, you will see the names for each active alarm, the associated alarm level, affect on service, and so forth. Some alarms have multiple probable causes and may have more than one alarm level; for example, either an MJ or MN.

2

If…	Then…
Power/Fuse Alarm indicates `CR` and the CR LED on the user panel is lighted (red),	both power feeds (A and B) for that shelf have been lost. Proceed to Step 3.
Power/Fuse Alarm indicates `MN` and MN LED on the user panel is lighted (yellow),	a single power feed (A or B) of the shelf has been lost. Proceed to Step 4.

3

If…	Then…
just prior to raising this alarm, the local craft manually inserted a circuit pack,	the on-site craft should use a light and check for bent pins on the metral connector. *Stop! End of Task.* **Reference:** Metral Press-Fit Repair Kit
just prior to raising this alarm, the local craft did not manually insert a circuit pack,	escalate to the next higher level of technical support. *STOP! End of Task.*

4

If…	Then…
the Alarm List description field indicates a failure on the *A feed*,	examine the circuit breaker for the *Ä feed* and determine if it has tripped.
the Alarm List description field indicates a failure on the *B feed*,	examine the circuit breaker for the *B feed* and determine if it has tripped.

5

If…	Then…
Circuit breaker A has tripped,	execute Step 6 and Step 7 for circuit breaker A.
Circuit breaker B has tripped,	execute Step 6 and Step 7 for circuit breaker B.
neither the A or B circuit breaker has tripped,	a problem exists with the physical connection at either the input or output of the power filter. Proceed to Step 8 and execute the remaining steps for the A or B feed as appropriate.

6 Reset the circuit breaker (A or B as appropriate).

7

If…	Then…
the circuit breaker trips a second time,	replace the appropriate power filter (A or B). *STOP! End of Task.* **Reference:** Task 706: Replace a Defective Power Filter
the circuit breaker does not trip a second time,	*STOP! End of Task.*

8 Check for problems with the physical connection at either the input or output of the power filter. As necessary, tighten all loose connections.

9 From the WaveStar CIT *System View*, left-click on the **Update Alarms** button.

10

If…	Then…
the Alarm List description field indicates a failure on the appropriate (A or B) feed,	proceed to Step 11.
the Alarm List description field does not indicate a failure on the appropriate (A or B) feed,	*STOP! End of Task.*

11 Escalate to the next higher level of technical support.

ND OF STEPS

Task 507: Clear Miscellaneous Discretes

Purpose

Use this task to clear a Miscellaneous Discrete (MISC) alarm.

> **Important!** Miscellaneous Discrete Inputs (MDI), by default, have a Not Reported (NR) state. However, each MDI may be provisioned, via an ASAP, to be reported as an MN, MJ, or CR alarm. Miscellaneous Discrete Outputs (MDO) cannot be provisioned to generate an alarm.

Required privilege code

You must have at least an M1 in order to complete this task.

Required equipment/ personnel

The following are required in order to complete this task:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap.

Task

Complete the following steps to clear the MISC alarm.

---

1 From the NE *Alarm List* screen, determine the name/function of this MISC alarm from the *Description* column.

---

2 Based on the name/function of the alarmed MDI, the craft should refer to their own local procedures for details on how to clear each MDI alarm.

> **Important!** From the equipment vendor perspective, it is difficult to specify a detailed Trouble-Clearing task for each MDI, which is provisioned with an alarm reporting ASAP. Potentially, each NE and each MDI could be different.

ND OF STEPS

☐

Task 509: Address ‘Alarm Test,’ ‘Auto Disconnected Cross-Connect,’ ‘Autonomous Reset,’ ‘BLSR Traffic Squelched,’ ‘Extra Traffic Preempted,’ ‘File Error ‘Memory Mismatch,’ ‘Non-Volatile Memory Usage,’ ‘Out of Memory,’ ‘Path Switch Active,’ ‘Path Switch Inhibited,’ ‘Resource Usage,’ ‘Ring Discovery in Progress,’ ‘Ring Start-up in Progress,’ ‘Software Error,’ ‘System in Restoration Mode,’ ‘System Restart,’ ‘System Start-up Complete,’

Purpose Use this procedure to determine the correct action to take in order to address the listed alarms:

No user action required Complete the following steps to address the identified alarms.

1

If the NE Alarm is…	**Then the Craft Response is…**
— Alarm Test — Auto Disconnected Cross-Connect — Autonomous Reset — BLSR Traffic Squelched — Extra Traffic Preempted — File error — HO Unequipped — Memory Mismatch — Non-Volatile Memory Usage — Out of Memory — Path Switch Active — Path Switch Inhibited — Resource Usage — Ring Discovery in Progress — Ring Traffic Preempted — Software Error — System in Restoration Mode — System Startup Complete — System Restart	Take NO action! **Important!** The system will automatically correct for this error condition and will, after a brief time interval, restore itself to normal processing activities. If this does not occur, contact your next level of technical support.

ND OF STEPS

Task 510: Investigate Cause When 'ABN' LED is Lighted

Purpose

The ABN LED serves to visually indicate, to the on-site craft person, any manually caused abnormal condition. These conditions could include any maintenance or provisioning activity that could affect service or potentially mask the reporting of service-affecting failures. *No user/craft initiated activities are required to clear a lighted ABN LED*. This LED will extinguish whenever the activity which resulted in lighting it is finished.

Required privilege code(s)

The user must have a privilege code of M1 and P3 (or higher) to perform this task.

Required equipment

The following list is the minimum set of required equipment:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap.

Safety precautions

To assure both personal safety and the proper functioning of the WaveStar TDM 10G product, it is imperative to review and understand these warnings and precautions prior to performing this task.

CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar CIT to prevent electrostatic discharge damage to sensitive components.

Related information

For related information, see Chapter 2 in WaveStar TDM 2.5G and 10G (2-Fiber) Alarm Messages and Trouble Clearing Guide,365-371-210.

Assumptions

This task starts with the assumption that you are already physically located at a node that displays a lighted ABN LED.

Before you begin

Prior to performing this task, the user must:

1. Connect the WaveStar CIT to the local area network (LAN) of the subject NE/ring.

2. Have a valid login on both the WaveStar CIT and all subject NE(s) within the ring.
3. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.

Task If desired, you may complete the following steps to investigate which user-initiated activity is responsible for lighting the ABN LED.

Important! The conditions that result in lighting the ABN LED are completely independent from the generation of alarms (CR, MJ, or MN). If an alarm exists simultaneously when the ABN LED is lighted, then the alarm should be treated independently of the ABN.

1 Any of the following conditions will result in lighting the ABN LED:

- During any lock-out (for example, *Fault-Timing/Sync Protection Switch-System Timing Reference Switch-Lockout*)
- During any forced switch (for example, *Fault-Timing/Sync Protection Switch-System Timing Reference Switch-Forced Switch*)
- During any manual switch that is revertive
- While the “Protection Line” is being accessed
- While a *Fault-Analysis-Cross-Connect Loopback* is in place (both hardware loopbacks and software loopbacks)
- While a *Fault-CP: Remove From Service* command is active.

2 At the WaveStar CIT and from the *System View* window, select:

- **Reports-NE Protection Switching Activity Log** or
- **Reports-NE User Log** or
- **Reports-NE Notification Log**

until one of the items listed in Step 1 is identified.

ND OF STEPS

Task 511: Clear Path Integrity Failure

Purpose Use this procedure to clear the *Path Integrity Failure* alarm.

Required privilege code(s) The user must have a privilege code of M1 and P3 (or higher) to perform this task.

Required equipment Use the following equipment to perform this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap.

Safety precautions To assure both personal safety and the proper functioning of the WaveStar TDM 10G product, it is imperative to review and understand these warnings and precautions prior to performing this task.

CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar CIT to prevent electrostatic discharge damage to sensitive components.

Related information For related information, see: Chapter 2.

Before you begin Prior to performing this task, the user must:

1. Connect the WaveStar CIT to the local area network (LAN) of the subject network element (NE)/ring.
2. Have a valid login on the WaveStar CIT and all subject NE(s) within the ring.
3. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.

Task Complete the following steps to clear the ‘Path Integrity Failure’ alarm.

1 At the WaveStar CIT and from the NE’s **System View** screen, click on the **Alarm List** button.

Important! The Column labeled **Probable Cause/Condition Type**

This condition means a complete circuit from a drop cross-connection back to an add cross-connection *does not* exist. The circuit path is open!

The most likely cause of this condition is one or more missing *through* and/or *add* cross-connections.

The *Path Integrity Failure* condition may appear as a transient condition.

2 Does the **Probable Cause/Condition Type** column list *Path Integrity Failure*?

If…	Then…
NO,	*STOP! End of Task*
YES,	continue.

3 If you have not already done so, wait 5 minutes before continuing with this procedure.

4 At the WaveStar CIT, click on the **Update Alarms** button.

5 Does the **Probable Cause/Condition Type** column include *Path Integrity Failure*?

If…	Then…
NO,	*STOP! End of Task*
YES,	continue.

6 From the column that is labeled *Alarm Issue Point*, identify the AID for this alarm. Make a note of that AID.

7 Do the following at the WaveStar CIT:

1. Select **View-Cross Connections**.

2. In the field labeled **Enter AID** enter the AID from Step 6.
3. Click on the **Select** tab.

---

8 In the **View-Cross Connections** window, verify that the desired cross-connection exists and is correct.

T 304 in the UOG

---

9 Were changes made to this NE’s cross-connections

If…	Then…
NO,	go to Step 12.
YES,	continue.

---

10 If you have not already done so, wait 5 minutes before continuing with this procedure.

---

11 At the WaveStar CIT, click on the **Update Alarms** button.

---

12 Does the **Probable Cause/Condition Type** column include *Path Integrity Failure*?

If…	Then…
NO,	*STOP! End of Task.*
YES,	continue.

---

13 Do the following at the WaveStar CIT:

1. Select **View-Rings-Ring Map**.
2. Click on the tab that is labeled **Ring**.
3. In the left window, select the BLSR of interest.
4. Click on the **Display Ring Map** button.
5. Click on the **Saves** button and save to a *named file* for later reference.

14 For the current node ID, pick a node port direction (say East) and log in to the next adjacent node neighbor.

> **Important!** The idea is to go sequentially around the ring until the problem is located and this alarm is cleared.

15 Do the following at the WaveStar CIT:

1. Select **View-Cross Connections.**
2. In the field that is labeled **Enter Aid,** enter the AID of the *Node Neighbor Port*.

   IMPORTANT: As necessary, refer to the named file (Step 13) for the node neighbor port AID.
3. Click on the **Select** tab.

16 Go to Step 8.

ND OF STEPS

Task 512: Clear Path Alarm

Purpose

Use this task whenever the *Alarm List* includes a Path Alarm. The complete list of Path Alarms is contained in Step 2 of this task.

Required privilege code

You must have at least an M1 to in order to complete this task.

Optional privilege code

If you are the person who also makes provisioning changes to this network, you may also require at least an P3 in order to complete this task.

Required equipment/ personnel

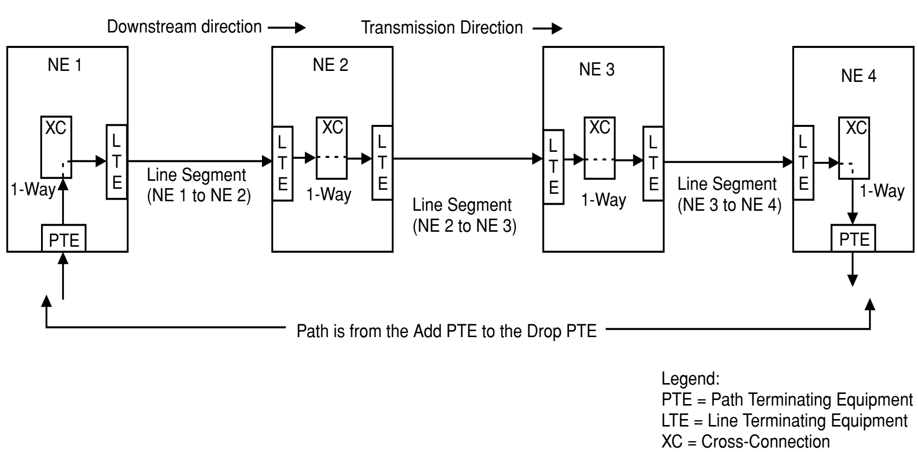
The following are required in order to complete this task:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap
- Optical power meter, to measure the level of received power
- Appropriate optical LBOs
- On-site assistance at the two (East and West) adjacent nodes.

Background information

Path Alarms are generally the result of improper provisioning. The “Path” is defined as running from one Path Terminating Equipment (PTE) to another PTE. Thus, the path may consists of from one to many line segments. A line is always terminated with Line Terminating Equipment (LTE). The following figure should more clearly demonstrate the difference between path and line.

Figure 512-1 Path vs Line Differences



For the proceeding figure the PTE function would more likely be filled by an STM1E, DS3, or OC-3 circuit pack. In some rare cases an OC-12 may perform this function. The LTE function would more likely be filled by an OC-192 or OC-48 port. And, to a lesser extent, an OC-12 or OC-3 port may also be used to perform this function.

Task Complete the following steps to clear the identified path alarm:

1

If the probable cause is…	Then…
AIS-P	go to **Reference:** SE 512-1
LOM	go to **Reference:** SE 512-2
LOP-P	go to **Reference:** SE 512-3
PLM-P	go to **Reference:** SE 512-4
RFI-P	go to **Reference:** SE 512-5
SQM	go to **Reference:** SE 512-6
TBER-P (EBER)	go to **Reference:** SE 512-7
TBER-P (Signal Degrade)	go to **Reference:** SE 512-8
UNEQ-P	go to **Reference:** SE 512-9

ND OF STEPS

SE 512-1: Clear AIS-P

Task

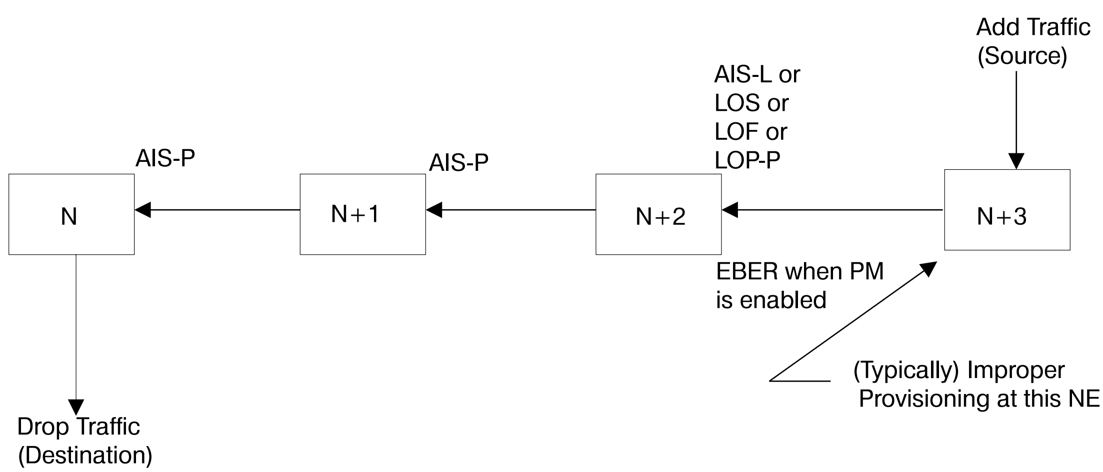
Alternate Insertion Signal - Path (AIS-P) is a path maintenance signal. It is inserted in the downstream path to indicate that there exists:

1. An upstream line signal defect, or
2. A local equipment failure that has impacted the associated signal.

The AIS-P alarm will appear at all NEs which are downstream from the problem. Any of following four upstream alarms (AIS-L, LOS, LOF, and LOP-P) can contribute to generating an AIS-P. Optionally, and only when Performance Monitoring (PM) is enabled, EBER can also be a contributor.

The AIS-P alarm will appear at all NEs within the downstream path, refer to Figure 512-1.

Figure 512-1 Example of a network that is indicating an AIS-P alarm



1 From the *System View* screen, click on the **Alarm List** button, and for this alarm determine its AID.

> **Important!** Since the shelf may have multiple rings it will be necessary to use the AID information in order to identify the appropriate ring, direction, and neighbor TID.

2 From the *System View* screen:

1. Click on menu **View>Rings>Ring Map**.

From the *View Ring Map* screen:

2. Expand down the tree structure and highlight the appropriate ring – as determined from the AID information from Step 1
3. Click on the **Select** button.
4. Click on the **Display Ring Map Graph** button.

From the *Ring Map Graph* screen:

5. Identify and make a note of the upstream NEs.
6. Click on the **Close** button.

From the *View Ring Map* screen:

7. Click on the **Close** button.

From the *System View* screen:

8. Click on *File-NE Disconnect*.

3 Follow the path for this AIS-P alarm and log in to the next adjacent upstream NE.

Important! If you are currently logged in to N, then the adjacent would be N+1. If currently logged in to N+1, then the adjacent would be N+2.

4 From the *System View* screen, click on the **Alarm List** button and determine whether the AIS-P alarm exists at this NE. Does this NE's *Alarm List* include the AIS-P alarm?

If…	Then…
YES,	go to Step 2 and sub-step 8.
NO,	this NE will display the underlying alarm (for example, AIS-L, LOS, LOF, LOP-P, or EBER). Determine which one of the five possible alarms is displayed and then refer to T 500 for the appropriate Trouble-Clearing task. *STOP! End of Task*.

ND OF STEPS

SE 512-2 Clear LOM Task

1 Information was not available at the time of publication.

N D O F S T E P S

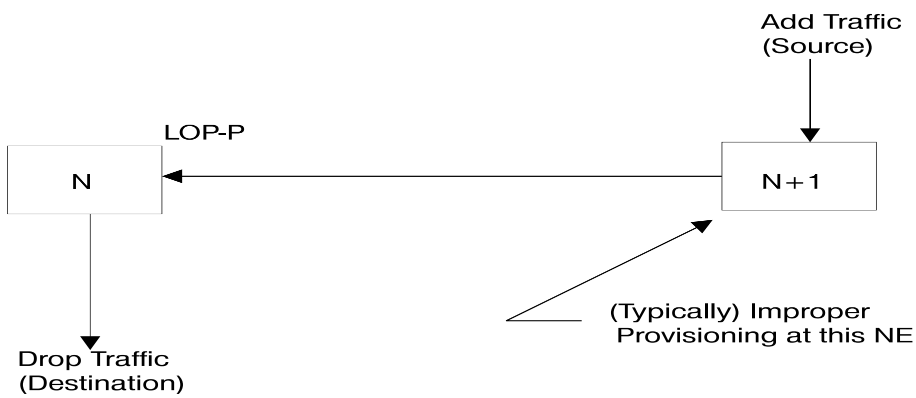
SE 512-3: Clear LOP Task

LOP-P falls within the category that is generally referred to as *service/path alarms*, rather than equipment and facilities alarms. Service/path alarms usually involve improper provisioning. The major issues are:

1. To identify the node that has improper provisioning (which is usually the source for this circuit/signal)
2. To alert the person or group that is responsible for provisioning the network.

The LOP-P alarm will only appear at the first downstream NE. Subsequent downstream NEs will be displaying AIS-P, refer to Figure 512-2.

Figure 512-1 Example of a network that is indicating an LOP-P alarm



Generally, but not necessarily in all cases, the person/group that performs trouble-clearing will be different from the person/group that performs network provisioning. For those networks that are provisioned by an Operations Support System (OSS) – then it is the OSS that should correct the provisioning error. For those networks that are not provisioned by an OSS but still have a person/group dedicated to provisioning – then that person/group should be contacted in order correct the provisioning error. Lastly, it is realized that there may be some few networks where one person is responsible for both trouble-clearing and provisioning.

> **Important!** This task may be used to support clearing of the LOP-P alarm regardless of who/whom is responsible for provisioning.

Important! Pointers, by definition, are a part of the SONET signal (tributary) overhead. Multiple things may cause the LOP-P alarm. These include: (a) no payload, (b) a mismatch between the delivered signal and the expected signal, (c) improper provisioning – either at the sending node or receiving node.

1 From the *System View* screen, click on the **Alarm List** button, and for this alarm determine its AID.

Important! Since the shelf may have multiple rings, it will be necessary to use the AID information in order to identify the appropriate ring, direction, and neighbor TID.

2 From the *System View* screen:

1. Click on `View-Rings-Ring Map`.

From the *View Ring Map* screen:

1. Expand down the tree structure and highlight the appropriate ring, as determined from the AID information from Step 1.
2. Click on the **Select** button.
3. Click on the **Display Ring Map Graph** button.

From the *Ring Map Graph* screen:

1. Identify and make a note of the upstream NEs.
2. Click on the **Close** button.

From the *View Ring Map* screen:

1. Click on the **Close** button.

From the *System View* screen:

1. Click on `File-NE Disconnect`.

3 Follow the path for this LOP-P alarm and log in to the next adjacent upstream NE.

Important! If you are currently logged in to N, then the adjacent would be N+1.

4 From the *System View* screen, click on the **Alarm List** button and determine whether the LOP-P alarm exists at this NE. Does this NE's *Alarm List* include the LOP-P alarm?

If…	**Then…**
YES,	go to Step 2 and sub-step 8.
NO,	this is the NE from which the person/group (that is responsible for provisioning) should begin to look for improper provisioning. Continue.

5 Is the network provisioned by an OSS?

If…	**Then…**
YES,	go to Step 18.
NO,	continue.

6 Is the network provisioned by a group other than an OSS?

If…	**Then…**
YES,	go to Step 19.
NO,	the craft that is responsible for trouble-clearing is also responsible for provisioning. Continue.

7

1. Obtain the office's provisioning records for the subject node.
2. Identify the type of cross connection (for example STS3c) for which the identified AID should be provisioned.

8 Verify that the cross-connection (for the alarmed AID) is provisioned correct per office records. From the *System View* screen:

1. Select `View-Cross Connections`.
2. In the field (*Enter Aid:*) enter the AID.

9 Is the cross-connection provisioned correct per office records?

If…	**Then…**
YES,	go to Step 14.
NO,	continue.

10 Reprovision (Modify) the cross-connection, for the identified AID, so that it is correct per office records.

Reference: T304

11 Log in to the adjacent downstream NE, and from the *System View* screen, select the **Alarm List** button.

12 Is this same alarm still active?

If…	**Then…**
YES,	go to Step 13.
NO,	*STOP! End of Supporting Task.*

13 Escalate to your next higher level of technical support.

14

1. Obtain the provisioning records for each NE that is downstream to this path.
2. Determine the correct type of cross-connection for the AID of the respective NE.

15 Sequentially, log in to each downstream NE and, as necessary, reprovision (Modify) the cross-connection so that it is correct per office records.

Reference: T304

16 While the login session at the most downstream NE (node where this traffic is dropped) is still active, click on the **Alarm List** button.

17 Is the same alarm still active?

If…	Then…
YES,	escalate to your next higher level of technical support
NO,	*STOP! End of Supporting Element*.

Important! Whenever the provisioning error has been corrected, this alarm will clear.

18 Inform the OSS that:

1. An LOP-P alarm is active.
2. If known, the TID of the NE which is suspected of having improper provisioning.
3. *STOP! End of Supporting Element*.

19 Inform this network's provisioning group that:

1. An LOP-P alarm is active.
2. If known, the TID of the NE which is suspected of having improper provisioning.
3. *STOP! End of Supporting Element*.

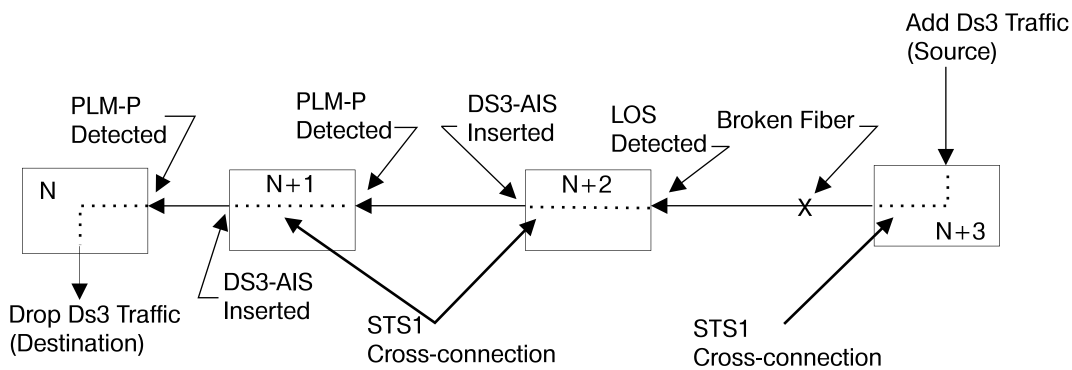
ND OF STEPS

SE 512-4: Clear PLM-P

Task

Figure 512-4 serves to indicate a path that is exhibiting the PLM-P alarm. Other problem conditions, which would result in producing this alarm, are possible. In summary, any problem condition which results in the payload containing a label other than what is provisioned (and expected) will result in producing a PLM-P alarm.

Figure 512-2 Example of a network path that is exhibiting a PLM-P Alarm



1 From the *System View* screen, click on the **Alarm List** button, and for this alarm determine its AID.

> **Important!** Since the shelf may have multiple rings, it will be necessary to use the AID information in order to identify the appropriate ring, direction, and neighbor TID.

2 From the *System View* screen:

1. Click on `View-Rings-Ring Map`.

From the *View Ring Map* screen:

2. Expand down the tree structure and highlight the appropriate ring – as determined from the AID information from Step 1

3. Click on the **Select** button.
4. Click on the **Display Ring Map Graph** button.

From the *Ring Map Graph* screen:

5. Identify and make a note of the upstream NEs.
6. Click on the **Close** button.

From the *View Ring Map* screen:

7. Click on the **Close** button.

From the *System View* screen:

8. Click on `File-NE Disconnect`.

3 Follow the path for this PLM-P alarm and log in to the next adjacent upstream NE.

Using Figure 512-4 for example, if you are currently logged in to N, then the adjacent would be N+1. If currently logged in to N+1, then the adjacent would be N+2.

4 From the *System View* screen, click on the **Alarm List** button and determine whether the PLM-P alarm exists at this NE. Does this NE's *Alarm List* include the PLM-P alarm?

If…	Then…
YES,	go to Step 2 and sub-step 8.
NO,	this is the NE where you will find another higher priority alarm. Refer to T 500 in order to determine the appropriate trouble-clearing task.

ND OF STEPS

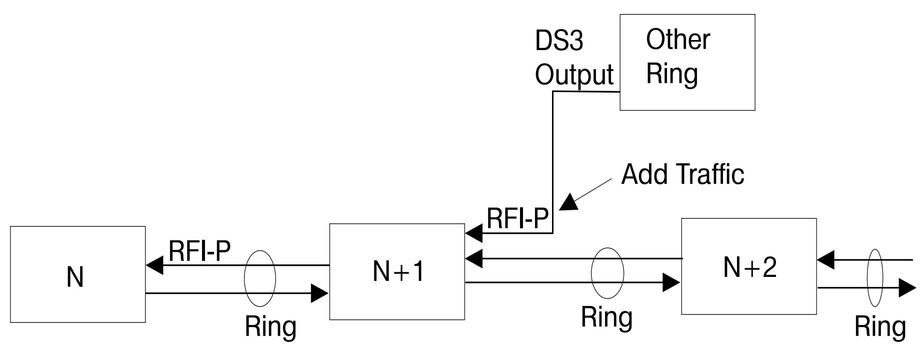
SE 512-5: Clear RFI-P

Task

Remote Failure Indication - Path (RFI-P) represents a far-end failure on an upstream NE that is sourcing a DS3 outgoing signal. The transmission path may include from zero to several NEs, each with through (trib-to-trib) cross-connections, before encountering the Destination NE – which will have an add (trib-to-port) cross-connection. Figure 512-5 serves to indicate a possible network arrangement exhibiting this alarm.

> **Important!** The NE that is sourcing the DS3 outgoing signal may be from this ring or a subtending ring.

Figure 512-3 Example of a Network Path that is Exhibiting an RFI-P Alarm



> **Important!** As a starting point, this task assumes that you are logged into the NE that is identified as "N". Refer to Figure 512-5.

1 From the *System View* screen, click on the **Alarm List** button and for this alarm determine its AID.

> **Important!** Since the shelf may have multiple rings it will be necessary to use the AID information in order to identify the appropriate ring, direction, and neighbor TID.

2 From the *System View* screen:

1. Click on `View-Cross Connections`.

From the *View-Cross Connections* screen:

2. Click on the **Equip** button.
3. Expand down the tree structure and highlight the appropriate (bay, shelf, circuit pack, and port), as determined by the AID information (from Step 1).
4. Click on the **Select** button.

From the *View-Cross Connections for* __________ screen:

5. Identify and make a note of the Destination Node NE Name (TID)
6. Click on the **Close** button.

---

3 From the WaveStar CIT screen, log in to the Destination Node NE Name.

> **Important!** In this case the Destination Node can be either: (a) the NE on the current ring that is actually sourcing the DS3 output signal, or (b) the NE that merely connects to another ring. For scenario "b", the other ring must be analyzed in order to locate and identify the failure.

---

4 From the *System View* screen, click on the **Alarm List** button and determine whether the RFI-P alarm exists at this NE. Does this NE's Alarm List include the RFI-P alarm?

If…	Then…
YES,	the source of this RFI-P alarm is an NE that is a part of the subnetwork that is sourcing the DS3 output signal. Continue.
NO,	the Alarm List will specify a higher priority alarm (for example, LOS, LOF, or EBER) involving this path. Refer to T 500 for the appropriate other Trouble-Clearing task. *Stop! End of Supporting Element.*

---

5 If the other ring consists of WaveStar products, establish a login session to the connected subnetwork NE, and then continue with Step 2.

6

If the subnetwork consists of…	Then…
WaveStar products for which you are responsible for providing maintenance,	establish a login session to the connected subnetwork NE, and continue with Step 2.
another vendor's products,	refer to that vendor's O&M documentation. *STOP! End of Supporting Element.*

N D   O F   S T E P S

SE 512-6: Clear SQM Task

1 Information was not available at the time of publication.

ND OF STEPS

SE 512-7 Clear TBER-P (EBER) — Task

1 Information was not available at the time of publication.

N D O F S T E P S

SE 512-8: Clear TBER-P (Signal Degrade)

Task

1 Information was not available at the time of publication.

N D O F S T E P S

SE 512-9: Clear UNEQ-P Task

UNEQ-P falls within the category that is generally referred to as service/path alarms, rather than equipment and facilities alarms. Service/path alarms usually involve improper provisioning. The major issues are:

1. To identify the node that has improper provisioning (which is usually the source for this circuit/signal; but not always)
2. To alert the person or group that is responsible for provisioning the network.

The UNEQ-P alarm serves to indicate that there exists a mismatch in the signal's label. There exists just one NE, within the particular path, that is sourcing the UNEQ-P alarm. All NEs that are downstream, in this path, will see this UNEQ-P alarm. There are two possible provisioning problems that will result in generating this alarm. They are:

- Path contains one NE that has a missing (or deleted) cross connection
- Path contains one NE that has a misconnected connection.

Figure 512-5 serves to indicate an UNEQ-P path with no cross-connection. Figure 512-6 serves to indicate an UNEQ-P path with an improperly provisioned cross-connection.

Figure 512-4 Currently no provisioned cross-connection

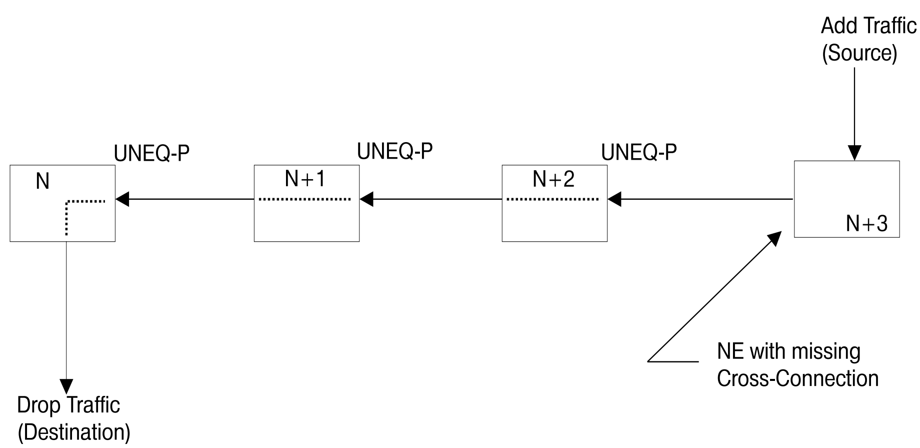
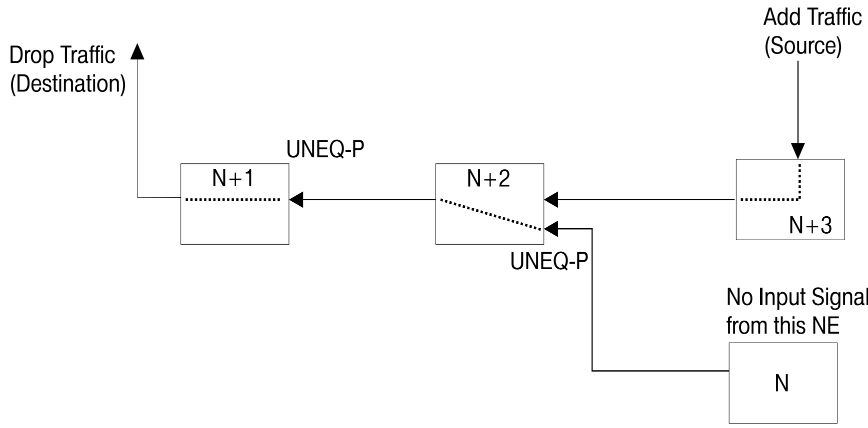


Figure 512-5 Improperly provisioned cross-connection



Generally, but not necessarily in all cases, the person/group that performs trouble-clearing will be different from the person/group that performs network provisioning. For those networks that are provisioned by an Operations Support System (OSS) – then it is the OSS that should correct the provisioning error. For those networks that are not provisioned by an OSS but still have a person/group dedicated to provisioning – then that person/group should be contacted in order correct the provisioning error. Lastly, it is realized that there may be some few networks where one person is responsible for both trouble-clearing and provisioning.

This task may be used to support clearing of the LOP-P alarm regardless of who/whom is responsible for provisioning.

1 From the *System View* screen, click on the **Alarm List** button and for this alarm determine its AID.

> **Important!** Since the shelf may have multiple rings it will be necessary to use the AID information in order to identify the appropriate ring, direction, and neighbor TID.

2 From the *System View* screen:

1. Click on `View-Rings-Ring Map`.

From the *View Ring Map* screen:

2. Expand down the tree structure and highlight the appropriate ring, as determined from the AID information from Step 1.
3. Click on the **Select** button.
4. Click on the **Display Ring Map Graph** button.

From the *Ring Map Graph* screen:

5. Identify and make a note of the upstream NEs.
6. Click on the **Close** button.

From the *View Ring Map* screen:

7. Click on the **Close** button.

From the *System View* screen:

8. Click on `File-NE Disconnect`.

---

3 Follow the path for this UNEQ-P alarm, and log in to the next adjacent upstream NE.

> **Important!** Using Figure 512-4 for example, if you are currently logged in to N, then the adjacent would be N+1. If currently logged in to N+1, then the adjacent would be N+2.

---

4 From the *System View* screen, click on the **Alarm List** button and determine whether the UNEQ-P alarm exists at this NE. Does this NE's *Alarm List* include the UNEQ-P alarm?

If…	Then…
YES,	go to Step 2 and sub-step 8.
NO,	this is the NE from which the person/ group (that is responsible for provisioning) should begin to look for improper provisioning. Continue.

---

5 Is the network provisioned by an OSS?

If…	Then…
YES,	go to Step 19.

If…	Then…
NO,	continue.

6 Is the network provisioned by a group other than an OSS?

If…	Then…
YES,	go to Step 20.
NO,	the craft that is responsible for trouble-clearing is also responsible for provisioning. Continue.

7

1. Obtain the office's provisioning records for the subject node.
2. Identify the type of cross-connection (for example STS3c) for which the identified AID should be provisioned.

8 Verify that the cross-connection (for the subject AID) is provisioned correct per office records. From the *System View* screen:

1. Select `View-Cross Connections`.
2. In the field (*Enter Aid:*) enter the AID.

9 Is the cross-connection provisioned correct per office records?

If…	Then…
YES,	go to Step 15.
NO,	continue.

10 Reprovision (Modify) the cross-connection for the identified AID so that it is correct per office records.

Reference: T304

11 From the *System View* screen:

1. Select `File-NE Disconnect`.
2. Click on the **YES** button in order to disconnect from the near-end NE.

---

12 Log in to the adjacent downstream NE, and from the *System View* screen, select the **Alarm List** button.

---

13 Is this same alarm still active?

If…	Then…
YES,	continue.
NO,	*STOP! End of Supporting Task.*

---

14 Escalate to your next higher level of technical support.

15

1. Obtain the provisioning records for each NE that is downstream to this path.
2. Determine the correct type of cross-connection for the AID of the respective NE.

---

16 Sequentially, log in to each downstream NE and, as necessary, reprovision (Modify) the cross-connection so that it is correct per office records.

Reference: T304

---

17 While the login session at the most downstream NE (node where this traffic is dropped) is still active, click on the **Alarm List** button.

18 Is the same alarm still active?

If…	Then…
YES,	escalate to your next higher level of technical support.
NO,	*STOP! End of Supporting Element*.

Important! Whenever the provisioning error has been corrected, this alarm will clear.

19 Inform the OSS that:

1. An LOP-P alarm is active.
2. If known, the TID of the NE which is suspected of having improper provisioning.
3. *STOP! End of Supporting Element*.

20 Inform this network's provisioning group that:

1. An LOP-P alarm is active.
2. If known, the TID of the NE which is suspected of having improper provisioning.
3. *STOP! End of Supporting Element*.

ND OF STEPS

Task 513: Clear ‘T1 Synchronization Reference Failure’

Purpose

Use this procedure to clear the alarm *T1 Synchronization Reference Failure*.

Before you begin

Before you begin this task you must:

1. Have a WaveStar® CIT that is connected to the subject network element (NE).
2. Log in to the WaveStar CIT application.
3. Log in to the subject WaveStar NE.

Required equipment

The following list contains the minimum equipment requirements in order to successfully complete this procedure:

- WaveStar CIT
- Wrist strap.

Task

Complete the following steps to clear the alarm *T1 Synchronization Reference Failure*.

1 From the System View screen, select/click on the button labeled **Alarm List**.

2 Does the Alarm List include *T1 Synchronization Reference Failure*?

If...	**Then...**
NO,	*STOP! End of Task*.
YES,	continue.

3

If the BITS clock is…	**Then the problem exists within the…**
alarmed,	external synchronization reference. **Reference:** “SE 513-1: External Synchronization Reference is Showing an Alarm” (-3)

If the BITS clock is…	Then the problem exists within the…
NOT alarmed,	cabling/connectors, and is located somewhere between the external synchronization reference and the NE. **Reference:** "SE 513-2: Locate and Correct the Problem Dealing with the Cable That Connects the NE to Its External Synchronization Reference" (-4)

4 Wait 2 minutes for the alarm to clear.

5 Click on the button **Update Alarms**, and continue with Step 2.

ND OF STEPS

SE 513-1: External Synchronization Reference is Showing an Alarm

Perform the steps below to correct the problem within the synchronization reference and/or clear the *Synchronization Reference Failure* alarm.

1 Replace the defective (and alarmed) circuit pack within the external synchronization reference.

> **Important!** Refer to the appropriate vendor documentation for that particular product.

2

If the external synchronization reference was…	Then…
repaired,	the NE's alarm should clear. *STOP! End of Supporting Element.*
NOT immediately repaired,	as an option, the craft may choose to provision the NE as "not connected." What this means is that the NE will ignore this input and clear this alarm. From the CIT *System View* screen, select **Configuration-Timing/Sync-System Timing**. And, under the box labeled **Cable-1 Timing Collection Source**: select the option **Not Connected**. **Important!** Whenever the defective circuit pack (within the external synchronization reference) is replaced, the craft should remember to provision the shelf (by removing the **Not Connected** selection) to again receive the external synchronization reference.

ND OF STEPS

SE 513-2: Locate and Correct the Problem Dealing with the Cable That Connects the NE to Its External Synchronization Reference

Perform the steps below to (a) locate and correct the external synchronization reference cable problem and (b) re-establish the signal from the external synchronization reference to the NE.

1 Go to the rear of the NE and identify the connector that receives, as its input, the external synchronization reference.

2 Verify that the cable is properly mated with its connector.

3 Trace the cable all of the way back to the external synchronization reference and verify that the cable and all intermediate connections are correct and in good condition. If the cable has been disconnected (anywhere along the route), then reconnect. If the cable (or any connector) is damaged, then replace as necessary.

ND OF STEPS

□

Task 514: Clear 'DCC Section Failure'

Purpose

Use this task whenever the NE Alarm List displays:

- *DCC Section Failure* (SONET alarm)

Before you begin

For 1+1 applications that are currently using a DCC channel, if the decision is made to enable/disable that DCC channel, then this alarm will appear (momentarily) while one NE has the DCC channel disabled and the other is pending that provisioning change. Once the DCC channel is disabled, at both NEs, this alarm will automatically clear. Failure of an incoming DCC channel is usually associated with provisioning or hardware failures at the source of the incoming signal or with other troubles involving the incoming signal.

> **Important!** Alarms should (normally) be resolved preceding from the higher level to the lower level. Thus when solving alarms with this strategy, a *DCC Section Failure*may be cleared as the result of clearing a higher level alarm.

Required equipment

The WaveStar® CIT Interface Terminal (CIT) is the minimum equipment required to complete this task.

Important considerations

This alarm can occur on any of the following types of facilities:

- Linear links (DRI)
- UPSR
- 1+1
- BLSR.

Trouble-shooting and alarm clearing strategy

The craft need only perform one or two primary activities in order to clear a *DCC SectionFailure* alarm. These are as follows:

1. Clear all higher level alarms that are associated with the identified AID.
2. If there were not any higher level alarms, or if the *DCC Section Failure* alarm continues, either enable the DCC channel at the neighbor NE or disable the DCC channel at the current NE.

> **Important!** Numbers 1 and 2 (above) will usually result in clearing this alarm. A third option is to reset/replace the near-end and far-end ADJCTL/DCCEI circuit packs.

Task Complete the following steps to clear a *DCC Section Failure* alarm.

1 From the **Alarm List** identify the AID for the circuit pack/port that is producing this alarm.

2 Does the identified AID have other (near-end) accompanying higher level alarms?

If…	Then…
YES,	continue with Step 3.
NO,	go to Step 6.

3

If the higher level alarm is…	Then clear the …
Loss of Signal,	LOS alarm. **Reference:** Task 543: Clear 'OC192, OC48, or OC12, OC3, or T3 DS3 Loss of Signal'
Loss of Frame,	LOF alarm. **Reference:** Task 545: Clear 'OC192, OC48, OC12, OC3, or T3 DS3 Loss of Frame'
Excessive Bit Error Rate	EBER alarm. **Reference:** T 521

4 On the *System View* screen, click on the **Update Alarms** button.

5 Is the *DCC Section Failure* still included in the list?

If…	Then…
YES,	continue with Step 6.
NO,	*STOP! End of Task*

6 For this near-end NE, verify that the DCC channel provisioning is appropriate for this AID (from Step 1).

Reference: T 305 in the 365-371-210

7 On the *System View* screen, click on the **Update Alarms** button.

8 Is the *DCC Section Failure* still included in the list?

If…	**Then…**
YES,	continue with Step 9.
NO,	*STOP! End of Task.*

9 From the *System View* screen select:

Administration>OSI Neighbor

10 From the **OSI Neighbor Map:**

1. Scroll down the directory structure and select the appropriate bay and shelf.
2. Click/highlight the appropriate **CP dccei (ADJCTL/DCCEI)**
3. Click on the **Select** button.

11 In the **Neighbor Map for _________** (AID) the three main columns that are of interest here are (a) Local Port, (b) Nbr Port, and (c) Nbr NE Name. In the Local Port column, locate the occurrence of the subject AID (from Step 1).

1. Scan across this same row to the Nbr Port and Nbr NE Name columns.
2. Identify the AID of the Nbr Port.
3. Click on the **Close** button to close this **Neighbor Map** for the -_-_-#-#-dccei-cp screen.

12 Click on the **WaveStar CIT View** and attempt to establish a login session by entering the Nbr NE Name in the field labeled *TID*. Were you able to log in to the Nbr Name NE?

If…	Then…
YES,	continue with Step 13.
NO,	refer to the task *Attempted Login to NE Failed*.… **Reference:** Task 518: Attempted Login to NE Failed — WaveStar CIT Screen Displays ‘Communication to NE Failed’ or ‘Communication Error’

13 Verify that the far-end NE has correct DCC channel provisioning for this AID (Nbr Port from Step 11).

Reference: T 305 in the UOG 365-371-210

14 Return to the original NE where this alarm was reported.

Important! This may be accomplished by establishing a new login session to that NE, or (if that NE session was saved to an icon) just click on the icon for the near-end NE.

15 On the *System View* screen, click on the **Update Alarms** button.

16 Is the *DCC Section Failure* still included in the list?

If…	Then…
YES,	continue with Step 17.
NO,	*STOP! End of Task*.

17 Verify that the near-end NE’s ADJCTL/DCCEI circuit pack is functioning properly.

> **Reference:** “SE 514-1: Verify correct operation of the ADJCTL/ DCCEI circuit pack” (-7)

18 On the *System View* screen, click on the **Update Alarms** button.

19 Is the *DCC Section Failure* still included in the list?

If…	**Then…**
YES,	continue with Step 20.
NO,	*STOP! End of Task.*

20 Log in to the (far-end) Nbr Name NE.

21 Verify that the NE’s ADJCTL/DCCEI circuit pack is functioning properly.

> **Reference:** “SE 514-1: Verify correct operation of the ADJCTL/ DCCEI circuit pack” (-7)

22 On the *System View* screen, left-click on the **Update Alarms** button.

23 Is the *DCC Section Failure* still included in the list?

If…	**Then…**
YES,	continue with Step 24.
NO,	*STOP! End of Task.*

24 Escalate to the next higher level of technical support.

ND OF STEPS

SE 514-1: Verify correct operation of the ADJCTL/DCCEI circuit pack

Task Perform the following steps to verify that the ADJCTL/DCCEI circuit pack is functioning properly.

1 Instruct the on-site craft to go to the subject NE and determine whether:

1. The ADJCTL/DCCEI circuit pack's FAULT LED is lighted (Red), or
2. The EI FAULT LED is lighted (Red), or
3. The ACTIVE LED is blinking green, or
4. The EI ACTIVE LED is blinking green.

2

If…	**Then…**
the answer to either (1.1, 1.2, 1.3, or 1.4) is *YES*,	continue with Step 3.
the answer to either (1.1, 1.2, 1.3, or 1.4) is *NO*,	*STOP! End of Task*.

3 Instruct the on-site craft to:

1. Go to the subject ADJCTL/DCCEI.
2. And, press the RESET switch, which is accessible from the front of the ADJCTL/DCCEI circuit pack.

4 Instruct the on-site craft to wait a minimum of 2 minutes for this circuit pack to reinitialize.

5 Instruct the on-site craft to visually determine the condition of the ACTIVE, EI ACTIVE, FAULT, and EI FAULT LEDs.

If…	**Then…**
the ACTIVE and EI ACTIVE LEDs are lighted continuously,	go to Step 12.
the FAULT is lighted	continue.

6 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Important! The newly installed ADJCTL/DCCEI should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

7 Wait 2 minutes for this circuit pack to reinitialize.

8 Click on the **Update Alarms** button.

9 Does the list include this same *DCC SectFailure* alarm?

If…	**Then…**
YES,	continue with Step 10.
NO,	*Stop! End of Task.*

10 Instruct the on-site craft to remove the newly installed ADJCTL/DCCEI circuit pack and reinsert the original ADJCTL/DCCEI.

11 Wait 2 minutes for this circuit pack to reinitialize.

ND OF STEPS

Task 516: Clear 'User-Network Side Sect Failure' or 'User-Network Side Line Failure'

Purpose

Use this procedure to clear:

- The SONET alarm *User-Network Side Sect Failure*, or
- The SONET alarm *User-Network Side Line Failure*,

Description

These alarms can occur only as the result of improper provisioning. The solution to clearing this alarm is to provision the DCC channel correctly.

> **Important!** Each DCC channel has two ends. One end must be provisioned as *User-Side* while the other must be provisioned as *Network-Side*. It does not matter which is *User-Side* nor which is *Network-Side*. And, for BLSR applications, the provisioning of one link does not have any impact on the provisioning of adjacent links.

Related information

For related information see *Chapter 7, Provisioning, Security, and Administration* in the *WaveStar® TDM 2.5G/10G User Operations Guide, 365-371-210*.

Prior to performing this task, you must:

1. Connect the WaveStar CIT to the LAN of the subject NE/ring.
2. Have a valid login on both the CIT and all subject NE(s) within the ring.
3. Log in to the CIT.

Task

Complete the following steps to clear the *User-Network Side.....Failure* alarm.

> **Important!** If you are logged in to one node, be that node part of a ring or part of a linear chain, then from your WaveStar CIT/local node you cannot determine whether a far-end node is in the process of rebooting. Similarly, you cannot tell whether a far-end DCC/EI circuit pack is in the process of resetting.

The time that it would take an NE to reboot (from start to finish) is approximately 15 minutes. The time that it would take a DCC/EI circuit pack to reset is about 2 minutes.

1 From the *System View* screen, click on the **Alarm List** button.

2 Is there one or more LOS alarms also included in the list?

If...	Then...
YES,	you should clear all LOS alarms before continuing with step 3. **Reference:** "Task 543: Clear 'OC192, OC48, or OC12, OC3, or T3 DS3 Loss of Signal'" (-1)
NO,	continue.

3 Does the list include an entry of *User-Network Side Sect Failure*, or *User-Network Side Line Failure*?

If...	Then...
YES,	continue.
NO,	*STOP! End of Task*.

4 Assume that one of the DCC/EI circuit packs is currently performing a reset. Wait 2 minutes, and then continue with Step 5.

5 Click on the **Update Alarms** button.

6 Does the alarm list still include *User-Network........Failure*?

If...	Then...
YES,	make a note of the corresponding/Local Port AID, and continue with Step 7.
NO,	*Stop! End of Task*.

7 Were you able to confirm that someone has taken action to manually reboot the far-end node?

If...	**Then...**
YES,	wait 15 minutes for the reboot to complete and go to Step 5. Determine if the far-end is being rebooted by contacting the appropriate far-end personnel.
NO,	continue.

8 From the *System View* screen:

1. Select **Configuration-DCC Terminations**.
2. From the **Configure DCC Terminations** window, expand down the directory structure until the appropriate ADJCTL/DCCEI is displayed.
3. Highlight the desired ADJCTL/DCCEI.
4. Click on the **Select** button.
5. On the right-hand side of the window, select the desired *Port AID:* (from the drop-down arrow).
6. For the field labeled ***LAPD Role:***, switch from the current selection to the alternate.
7. Click on the **Apply** button.
8. Click on the **Close** button.

9 Click on the **Update Alarms** button.

10 Does the alarm list still include *User-Network........Failure*?

If...	**Then...**
YES,	make a note of the corresponding/Local Port AID, and continue with Step 11.
NO,	*STOP! End of Task*.

11 Measure the received optical power level and compare the measurement to the specification.

Reference: "Task 712: Measure Received Optical Power" (-1)

12 Verify that the appropriate LBO is installed on the *IN* port.

Reference: "Task 711: Select Lightguide Buildout" (-1)

13 Click on the **Update Alarms** button.

14 Does the alarm list still include *User-Network......Failure*?

If…	Then…
YES,	make a note of the corresponding/Local Port AID, and continue with Step 15
NO,	STOP! End of Task.

15 Escalate to the next higher level of technical support.

ND OF STEPS

Task 517: Clear ‘DCC Sect Disabled-Unavailable’or ‘DCC Line Disabled - Unavailable’

Purpose

Use this task whenever the NE Alarm List displays:

- *DCC Section Disabled - Unavailable*
- *DCC Line Disabled - Unavailable*.

Required equipment

Use the WaveStar CIT Interface Terminal (CIT) to complete this task.

Before you begin

Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE/ring.
2. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE/ring.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task

Complete the following steps to clear a ‘DCC ______ Disabled-Unavailable’ alarm.

Important! The solution to clearing this alarm is (a) to review the list of port AIDs that already have a DCC channel assigned to them, (b) to identify one or more AIDs that no longer need/require a DCC channel, (c) to free-up (delete) those DCC channels that are no longer needed/required—thus making them available.

1 From the Alarm List, identify the AID for the shelf that is producing this alarm.

2 From the *System View* screen:

1. Click on **View-DCC Terminations**.
2. In the Windows-like explorer screen, expand/scroll down the directory until the desired CP dccei is displayed. Then, highlight line item ***CP dccei*** *(ADJCTL/DCCEI)*.
3. Click on the **Select DCC Pack** button.

Important! The *View DCC Terminations* screen lists the number of **Remaining Channels**. While this alarm is active, the **Remaining Channels** field will always show the number 0.

If you do not identify at least one DCC channel to free-up, then it will not be possible to clear this alarm.

3 Review the list of port AIDs and identify one or more that are no longer needed/required.

4 Disable the identified DCC channel.

Reference: T 305

5 Click on the **Update Alarms** button.

6 Is the 'DCC Sect Disabled-Unavailable' or 'DCC Line Disabled - Unavailable'alarm still listed?

If…	Then…
YES,	continue with Step 7.
NO,	*STOP! End of Task*.

7 Escalate to your next higher level of technical support.

ND OF STEPS

Task 518: Attempted Login to NE Failed — WaveStar CIT Screen Displays ‘Communication to NE Failed’ or ‘Communication Error’

Purpose

Use this procedure when the WaveStar Craft Interface Terminal (CIT) screen displays one of the following messages:

- `Attempted Login to NE Failed`
- `The OSI Association request has failed!`

Required equipment

The following equipment is required in order to complete this task:

- WaveStar CIT
- Wrist strap

Related information

For related information, see *Appendix A, WaveStar CIT Tutorial* in the *, User Operations Guide, 365-371-210*.

Task

Complete the following steps to reestablish communication and log in to the NE:

---

1 Given that the WaveStar CIT screen currently displays:

- `Attempted Login to NE Failed`, or
- `The OSI Association request has failed!`

Quit the WaveStar CIT applications software by selecting **File-Exit** from the menu bar and then clicking on the **YES** button.

---

2 Restart the WaveStar CIT applications software, and then retry to:

- Connect to the NE, and if that is successful, then
- Log in to the NE.

---

3 Were the connect and log-in sessions successful?

If...	Then...
YES,	*STOP! End of Task.*
NO,	continue.

4 Verify that the LAN cable which connects the PC to the NE is not damaged and that all connections are proper and secure. Replace any damaged cable, and repair any connection problems.

> **Important!** The WaveStar CIT will again display one of the two failed connection messages.

5 You should quit the WaveStar CIT applications software by selecting **File-Exit** from the menu bar and clicking on the **YES** button.

6 Restart the WaveStar CIT applications software, and then retry to:

1. Connect to the NE, and if that is successful, then
2. Log in to the NE.

7 Were the connect and log-in sessions successful?

If…	Then…
YES,	*STOP! End of Task.*
NO,	continue. **Important!** The ADJCTL/DCC circuit pack is unavailable whenever this circuit pack is: (a) performing a reboot, or (b) failed (fail LED is lighted red). Determining the status of this circuit pack will require an on-site visual inspection of the circuit pack LEDs.

8 Is the ADJCTL/DCC circuit pack's fail LED lighted red?

If…	Then…
YES,	replace this circuit pack, and then go to Step 5.

If…	Then…
NO,	continue. **Important!** The total time required for the ADJCTL/DCC circuit pack to reboot should be less than 2 minutes. **Reference:** Task 561: Clear 'ADJCTL/ DCCEI Circuit Pack Failure'

9 Is the ADJCTL/DCC circuit pack performing a reboot?

If…	Then…
YES,	wait 2 minutes, and then go to Step 5.
NO,	continue. **Important!** If the SYS50D circuit pack is rebooting you cannot log in until that process completes.

10 Is the SYS50D rebooting?

If…	Then…
YES,	wait 2 minutes, and then go to Step 5.
NO,	continue. **Important!** If the NE is performing a system reboot you cannot log in to the NE until the process has completed.

11 Is the NE performing a reboot?

If…	Then…
YES,	wait (approximately 20 minutes) for this process to complete.
NO,	continue.

12 Instruct the on-site craft to take the following actions:

1. Locate the ADJCTL/DCC circuit pack.
2. While using the wrist strap, unlatch and physically pull out this circuit pack (only a short distance).
3. Reseat this circuit pack.

13 Wait 2 minutes, and then continue with the next step.

Important! The total time required for the ADJCTL/DCC circuit pack to reboot should be less than 2 minutes. A reboot is indicated by a flashing green LED on the circuit pack faceplate.

14 Quit the WaveStar CIT applications software by selecting **File-Exit** from the menu bar, and then clicking on the **YES** button.

15 Restart the WaveStar CIT applications software, and try again to:

1. Connect to the NE, and if that is successful, then
2. Log in to the NE.

16 Were the connect and log-in sessions successful?

If…	Then…
YES,	*STOP! End of Task*.
NO,	continue.

17 Instruct the on-site craft to:

1. Locate the SYS50D circuit pack.
2. While using the wrist strap, unlatch and physically pull out this circuit pack (only a short distance), then
3. Reseat this circuit pack.

18 Wait 2 minutes and then continue.

Important! The total time required for the ADJCTL/DCC circuit pack to reboot should be less than 2 minutes. A reboot is indicated by a flashing green LED on the circuit pack faceplate. While the circuit pack is rebooting, you cannot log in until that process completes.

19 You should quit the WaveStar CIT applications software by selecting **File-Exit** from the menu bar, and then clicking on the **YES** button.

20 Restart the WaveStar CIT applications software, and then try again to:

1. Connect to the NE, and if that is successful, then
2. Log in to the NE.

21 Were the connect and log-in sessions successful?

If…	Then…
YES,	*STOP! End of Task*.
NO,	Escalate this problem to your next higher level of technical support.

ND OF STEPS

Task 521: Clear 'T-BERL Type Alarms'

Purpose

Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.

Required equipment

The following is a list of required equipment for completing this procedure:

- WaveStar Craft Interface Terminal (CIT).

Optional equipment/optional personnel

The following is a list of equipment and personnel that may (or may not) be needed:

- Appropriate DS3 circuit pack (which will be unique per the particular product type of NE)
- On-site personnel at both the local and upstream NE.

Before you begin - ds3 bit error rate

The DS3 Bit Error Rate (T-BERL) alarm is likely to be caused by one of the following conditions on the incoming DS3 line:

- Failure of the DS3 office source
- Failure of the DS3/EC1 port unit circuit pack (resulting in traffic degradation)
- Loose coaxial connector on the shelf DS3 connector panel

Important! If the alarm is caused by the failure of the DS3 office source then clearing the alarm depends on clearing the problem with the external equipment.

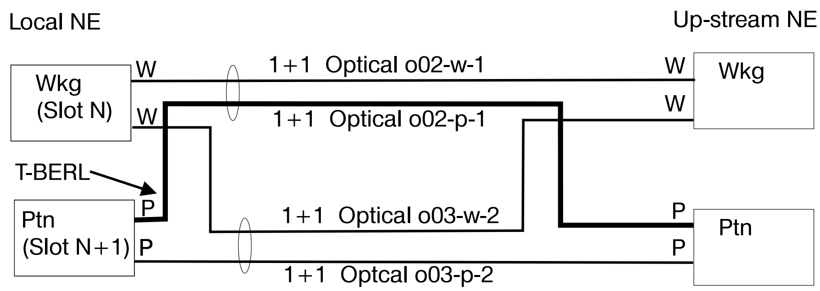
Before you begin - OC-N signal degrade or excessive error

An OC-N T-BERL alarm can occur on either the working (Wkg) or protection (Ptn) link. The occurrance of a Signal Degrade or Excessive error alarm, on a Wkg link/port, will (conditions permitting) result in a protection switch. This trouble-clearing task assumes that all 1+1 optical port protection groups are provisioned properly (meaning the Wkg and Ptn can never be on the same circuit pack).

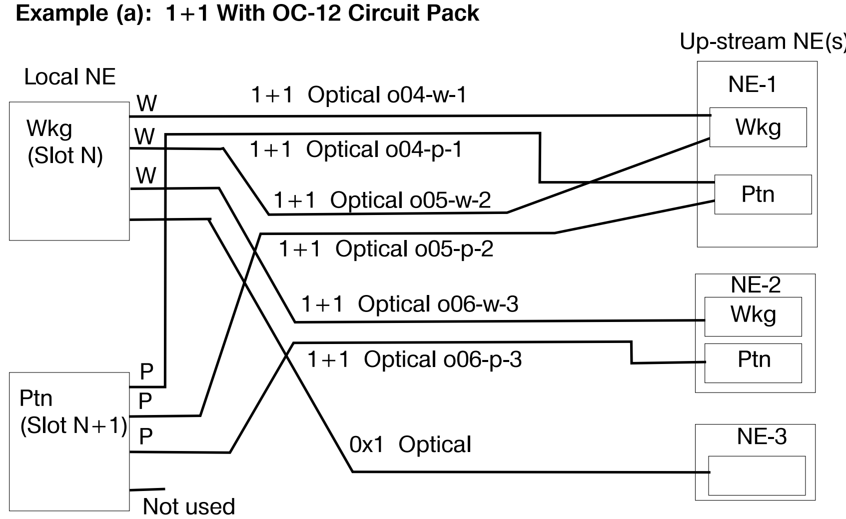
You should obtain from office records (or create locally) a diagram of the subject 1+1 or 0x1 optical protection group. The following series of diagrams depict possible configurations and are intended to aid you in creating a diagram for your particular network.

The only difference between a "Siganl Degrade" and an "Excessive

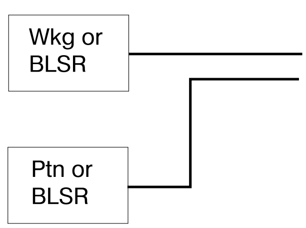
Error” alarm is the level of severity. Thus, the same trouble-clearing procedure is applicable for both.



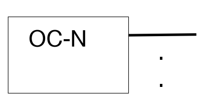
Example (a): 1+1 With OC-12 Circuit Pack



Example (b): 1+1, 0x1, and “Not-Used” With OC-3 Circuit Pack & Multiple Nodes



Example (c): 1+1 or BLSR With OC-48/OC-192 Circuit Pack



Example (d): 0x1 OC-n (where n = 3, 12, 48 or 192) Circuit Pack

Task If the problem is determined to not be caused by external equipment then complete the following steps to clear a T-BERL alarm.

1 From the Alarm List, determine the AID of the alarmed port.

2

If the alarm is ...	Then .....
DS3 Port, DS3 Bit Error	go to SE 521-1
OC-N, Bit Error/Signal Degrade or Excessive Error	go to SE 521-2
EC1, Bit Error/Signal Degrade or Excessive Error	go to SE 521-3

END OF STEPS

SE 521-1 Clear ‘T-BERL DS3 Port, DS3 Bit Error’

Task Use this SE to clear a T-BERL (Line) alarm for both 0x1 and 1xN DS3 equipment protection schemes.

1 From the *System View* screen:

1. Select menu item **View>View Equipment Details**
2. Expand/scroll down the structure until the subject AID (Port __) is highlighted.
3. Click on the **Select** button.
4. In the right-half of the *View Equipment Details* screen determine the current parameter for the field labeled **DS3 Signal Degrade Thresh**. The default (and typical value) will be 10^{-6}.

   Important! Make a note of the threshold value.

Important! With regards to DS3 circuit packs, this WaveStar product supports both 1xN equipment protection and 0x1 (no equipment protection). No facility protection is provided for DS3 links.

2 From the *System View* screen:

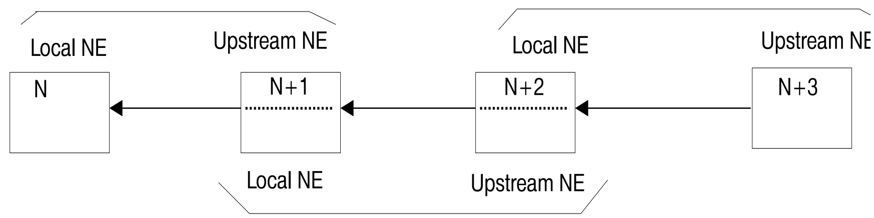
1. Select menu item **View>Protection**
2. In the *View Protection* window expand/scroll down until item (1xN Equipment eds3ec1grp) is displayed.
3. Determine whether the subject AID, which was displayed in the alarm list, is a part of a 1xN equipment protection group?

   Important! For possible future use, make a note of whether the AID is part of a 1xN protection group.
4. Observe the field labeled **Switch-Request State:** and determine (a) whether there currently exists a switch condition, and if so (b) the type of switch.

   Important! Make a note of your observation concerning the Switch-Request State.

3 Refer to office records and determine the network topology of this DS3 link.

The following figure depicts one possible upstream configuration and suggested NE labeling sequence.



Important! There may be from one to multiple upstream NEs. The source for this alarm may be any one of these NEs or any one of the interconnecting links (lines). Thus, the technique is to localize the alarm between just two NEs and subsequently trouble-shoot just that segment.

Important! The upstream NE(s) may be any of a wide range of products. These products (NEs) may be from one or more vendors and may involve one or multiple service providers.

4 Use appropriate means to determine whether the subject upstream NE is also detecting this same alarm.

5

If the upstream NE also has this alarm	Then ....
YES	from this current upstream NE trouble-shoot the next segment (for example N+2, or N+3, and so forth). You will do this by repeating steps 4 and 5 until you identify an upstream NE which is not exhibiting this alarm, which is the point where you will obtain the answer NO and drop down. Go to Step 4 and repeat for the new upstream NE.

If the upstream NE also has this alarm	Then ....
NO	you have just localized the alarm to one of the following three places (a) down-stream receiver, (b) the current up-stream transmitter, or (c) the cabling between the the respective NEs. Continue.

6 Using the information that was recorded in Step 2,

If the port is part of a 1xN equipment protection group	Then ...
YES	continue.
NO	go to Step 26.

7 Steps 7 through 38 are written from the perspective that the upstream NE is a WaveStar Product. If that is not the case - then you should substitute the equivalent commands for the actual product NE. The term “local NE” is always the NE that is just one down from the current upstream NE.

If the local NE has an active Switch Request State	Then
YES	that Switch Request State must be cleared before continuing with this task. As appropriate, check with your provisioning center(s) to determine the exact reason for switch.
NO	continue.

8 From the *System View* screen select menu item:

1. **Fault>Protection Switch**
2. And then in the *View Protection* window expand/scroll down until 1xN Equipment eds3ec1grp is displayed
3. Click on **1xN Equipment eds3ec1grp**

4. Click on the **Select** button, which is located at the bottom of this window
5. In the right-half of this window observe the field labeled **Working Pack AID**. Click in the drop-down arrow to the right and select the circuit pack for the port that exhibits this T-BERL alarm.
6. In the field labeled *Switch Type:* click on the drop-down arrow and select **Manual**.
7. Click on the **Apply** button.
8. Read the warning statement and as appropriate click on the **YES** button.
9. Wait 5-minutes and then click on the **Update Alarms** button.

9

If the Alarm List still includes this alarm	Then ....
YES	you have just localized the alarm to one of the following two places (a) the up-stream transmitter, or (b) the cabling between the the respective NEs. Go to Step 18.
NO	continue.

10 Verify that the protection pack has the same (or higher number, for example 10^{-6}, 10^{-7}, 10^{-8}, or 10^{-9}) Signal Degrade BER Threshold as noted for the alarmed DS3 port in Step 1. From the *System View* screen:

1. Click on the corresponding port of the DS3 protection pack.
2. Select menu item **View>View Equipment Details**.
3. Click on the **Select** button.
4. Observe the displayed parameter to the right of the field labeled **DS3 Signal degrade Threshold:**.

11

If the DS3 Signal Degrade Threshold is the same or a higher number.......	Then ......
YES	the problem has been conclusively identified as the single port on the "protected" circuit pack. Continue.

If the DS3 Signal Degrade Threshold is the same or a higher number.......	Then ......
NO	Go to Step 14.

12 Instruct the on-site craft to:

1. Unlatch, and then remove, the circuit pack that is being protected.
   Reference: T 700
2. Insert the same type circuit pack (or later vintage) back into the same slot.
3. Inform you of whenever the newly inserted circuit pack has a steady green LED.

13 From the *Switch Protection* window (that is **Fault**>**Protection Switch**...):

1. Observe the field labeled **Switch Type:** and click on the drop-down arrow.
2. Select item **Clear**
3. Click on the **Apply** button.
4. Read the warning statement and as appropriate click on the **YES** button. **Stop! You have completed this task**.

Important! Although unlikely, it is possible for the subject protection pack's port to be provisioned with a lower BER threshold. To make a completely accurate comparison, this port must have the same BER threshold as that of the alarmed port.

14 If your login permissions permit (if not - then obtain assistance from your provisioning center), from the *Shelf View* select/highlight:

1. The appropriate port on the protection pack
2. Right-click on that port
3. Select submenu item **Provision Port __**
4. Select the tab labeled **Fault**
5. Provision the field labeled **Signal Degrade BER Thresh** to the same parameter as noted in Step 1.
6. Click the **OK** button

7. Read the information warning and as appropriate click on the **YES** button
8. Wait 5-minutes and then click on the **Update Alarms** button

15

If the T-BERL alarm is listed ...	Then ...
YES	the problem is with the cabling or upstream NE transmitter. Continue.
NO	go to Step 12.

16 At the local NE and as appropriate, re-provision the *Signal Degrade BER Thresh* parameter of the protection pack to it's original value.

17 From the *View Protection* window (that is **Fault>Protection Switch**...):

1. Observe the field labeled **Switch Type:** and click on the drop-down arrow.
2. Select item **Clear**
3. Click on the **Apply** button.
4. Read the warning statement and, as appropriate, click on the **YES** button.

Important! This step assumes that the upstream NE is providing 1xN equipment protection

18 At the upstream NE, identify the circuit pack for the subject DS3 link.

19 At the upstream NE and from the *System View* screen select:

1. **Fault>Protection Switch**
2. And then in the *View Protection* window expand/scroll down until 1xN Equipment eds3ec1grp is displayed
3. Click on **1xN Equipment eds3ec1grp**
4. Click on the **Select** button, which is located at the bottom of this window

5. In the right-half of this window observe the field labeled **Working Pack AID**. Click in the drop-down arrow to the right and select the circuit pack of the subject DS3 link.
6. In the field labeled *Switch Type:* click on the drop-down arrow and select **Manual**.
7. Click on the **Apply** button.
8. Read the warning statement and as appropriate click on the **YES** button.
9. Wait 5-minutes and then inform the local NE to determine whether the subject alarm is still active.

---

20 At the local NE and from the *System View* screen, click on the **Update Alarms** button.

If the T-BERL alarm is still listed ...	Then ...
YES	the problem is the cabling between the local NE and upstream NE. Continue.
NO	the problem is the upstream DS3 circuit pack. Go to Step 24.

---

21 Use local procedures to identify and correct the problematic cable/connector. Whenever appropriate (be sure to wait at least 5-minutes after the correction has been completed), verify that the problem has been corrected and that the alarm no longer exist by continuing.

---

22 At the local NE and from the *System View* screen click on the **Update Alarms** button

If the Alarm List still includes the T-BERL alarm	Then ...
YES	escalate to your next higher level of technical support.
NO	the problem has been identified, corrected, and the alarm cleared. All that remains is to clear the Protection Switch at the upstream NE.

23 At the local NE and from the *View Protection* window (that is **Fault>Protection Switch** ...):

1. Observe the field labeled **Switch Type:** and click on the drop-down arrow.
2. Select item **Clear**
3. Click on the **Apply** button
4. Read the warning statement and, as appropriate, click on the **YES** button.
5. **Stop! End of task**.

Important! At this point the objective is to determine whether the upstream transmitter is causing the alarm. This series of steps assumes that the upstream NE's DS3 transmitter is part of 1xN equipment protection group.

24 At the upstream NE instruct the on-site craft to:

1. Unlatch, and then remove, the circuit pack that is being protected.
   Reference: T 700
2. Insert the same type circuit pack (or later vintage) back into the same slot.
3. Inform you of whenever the newly inserted circuit pack has a steady green LED.

25 At the upstream NE and from the *View Protection* window (that is **Fault>Protection Switch**...):

1. Observe the field labeled **Switch Type:** and click on the drop-down arrow.
2. Select item **Clear**
3. Click on the **Apply** button.
4. Read the warning statement and, as appropriate, click on the **YES** button.
5. Wait 5-minutes and then inform the local NE to determine whether the subject alarm is still active. Go to Step 22.

26 **Note:** By definition, it is not possible to do a protection switch on 0x1 equipment. However, a "Bridge and Roll" operation can be used to accomplished the approximate equivalent functionality. Thus, before an in-service circuit pack can be removed all traffic must be "Bridged and then Rolled" to another circuit pack and alternate facilities.

Use locally developed procedures (which will be specific to your particular application) to "Bridge and Roll" all traffic from the local NE circuit pack and upstream NE circuit pack.

27 At the local NE, instruct the on-site craft to:

1. Unlatch, and then remove, the subject circuit pack.
   Reference: T 700
2. Insert the same type circuit pack (or later vintage) back into the same slot.
3. Inform you of whenever the newly inserted circuit pack has a steady green LED.
4. Bridge and Roll all traffic back onto the local NE and upstream NE's DS3 circuit pack.
5. Wait 5-minutes and then click on the **Update Alarms** button.

28

If (at the local NE) **the T-BERL alarm is listed ...**	**Then ...**
YES	the problem is with the cabling or upstream NE transmitter. Continue.
NO	go to Step 12.

29 At the local NE and upstream NE, "Bridge and Roll" all traffic back onto the alternate facilities.

30 At the local NE, instruct the on-site craft to:

1. Unlatch, and then remove, the newly inserted circuit pack and re-insert the original circuit back into that slot.
2. Inform you of whenever the original circuit pack has a steady green LED.

31 At the upstream NE, instruct the on-site craft to:

1. Unlatch, and then remove, the subject circuit pack.
   Reference: T 700
2. Insert the same type circuit pack (or later vintage) back into the same slot.
3. Inform you of whenever the newly inserted circuit pack has a steady green LED.

32 At the local NE and upstream NE, "Bridge and Roll" all traffic back onto the original facilities.

33 At the local NE, wait 5-minutes and then click on the **Update Alarms** button.

If the T-BERL alarm is still listed	**Then ....**
YES	the problem is the cabling between the local NE and upstream NE. Continue.
NO	**Stop! you have completed this task.**

34 At the local NE and upstream NE, "Bridge and Roll" all traffic back onto the alternate facilities.

35 At the upstream NE, instruct the on-site craft to:

1. Unlatch, and then remove, the newly inserted circuit pack and re-insert the original circuit back into that slot.
   Reference: T 700
2. Inform you of whenever the newly inserted circuit pack has a steady green LED.

36 Use local procedures to identify and correct the problematic cable/connector. Whenever appropriate (be sure to wait at least 5-minutes after the correction has been completed), verify that the problem has been corrected and that the alarm no longer exist by continuing.

37 At both the local and upstream NEs, “Bridge and Roll” all traffic back onto the original facilities.

38 At the local NE, wait 5-minutes and then click on the **Update Alarms** button:

If the Alarm List still includes the T-BERL alarm	Then ...
YES	escalate to your next higher level of technical support.
NO	the problem has been identified, corrected, and the alarm cleared. **Stop! you have completed this task**.

END OF STEPS

SE 521-2 Clear ‘T-BERL Bit Error/Signal Degrade, OC-N Port’ or ‘T-BERL Excessive Error, OC-N Port’

Task At the time of this publication information for this SE was not available.

END OF STEPS

SE 521-3 Clear ‘T-BERL Bit Error/Signal Degrade, EC1 Port’ or ‘T-BERL Excessive Error, EC1 Port’

Task At the time of this publication information for this SE was not available

END OF STEPS

Task 524: BLSR Inconsistent APS Codes

Purpose

Use this procedure to address a *BLSR Inconsistent APS Codes* alarm.

Required Equipment

Use the WaveStar Craft Interface Terminal (CIT) to complete this task.

BLSR Inconsistent APS Codes Alarm Occurrence

This alarm is issued if, in the 12 frames starting with the last frame containing a previously inconsistent APS code, there are not 3 consecutive frames containing identical K-bytes.

Common reasons for occurrence

This alarm may occur during normal ring maintenance or when there is an OC-48/OC-192 protection circuit pack failure or CTL/SYS50DM circuit pack failure.

Most common solutions

This alarm should clear itself after a few minutes.

Related information

For related information, see *Chapter 2, Trouble Clearing*.

Task

> **Important!** A 'BLSR Inconsistent APS Codes' alarm cannot be cleared by itself. It is usually associated with one or more other failures at the local node or a remote node.

Use the procedure below to determine the associated failure which is causing the 'BLSR Inconsistent APS Codes' alarm.

1 Contact or, if possible, log in to the node that is reporting the 'BLSR Inconsistent APS Codes' alarm.

2 Determine whether that node is detecting/reporting an OC-48/OC-192 Port SD.

If...	Then...
YES,	clear the OC-48/OC-192 Port SD alarm and continue. **Reference:** T 521
NO,	continue.

3 Determine whether that node is detecting/reporting a SYS50DM circuit pack failure.

If…	Then…
YES,	clear the SYS50DM circuit pack failure and continue. In some situations, problems with the SYS50DM circuit pack can cause a BLSR Inconsistent APS Codes alarm. **Reference:** Task 552: Clear 'SYS50DM Circuit Pack Failure'
NO,	continue.

4 Click on the **Update Alarms** button.

5 Is the same 'BLSR Inconsistent APS Codes alarm' still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	*STOP! End of Task*.

Task 525: BLSR Improper APS Codes

Purpose

Use this procedure to address a *BLSR Improper APS Codes* alarm.

Required Equipment

Use the WaveStar® Craft Interface Terminal (CIT) to complete this task.

Related information

For related information, see Chapter 2, “Maintenance/Trouble-Clearing” in this document.

Improper APS Code alarm occurrence

This alarm occurs when a manually initiated or automatic switch request does not complete properly.

Common reasons for occurrence

This alarm may occur when there is an OC48/STM16 (OC192/STM64) protection circuit pack failure, CTL/SYS50DM circuit pack failure, or other problems associated with these circuit packs.

Most common solutions

Perform the following steps to clear this alarm:

- Isolate the problem to the OC48/STM16 (OC192/STM64) protection circuit pack and replace it.

Task

Complete the following steps to address a *BLSR Improper APS Codes* alarm.

1 Contact or, if possible, log in to the node that is reporting the *BLSR Improper APS Codes* alarm.

2 Determine whether that node is detecting/reporting an OC48/STM16 Signal Degrade (or OC192/STM64 Signal Degrade).

If...	Then...
YES,	clear the Signal Degrade alarm and continue with next step. **Reference:** T 521
NO,	continue with next step.

3 Determine whether the node is detecting/reporting a CTL/SYS50DM circuit pack failure.

If...	**Then...**
YES,	clear the CTL/SYS50DM circuit pack failure and continue. In some situations, problems with the CTL/SYS50DM circuit pack can cause a *BLSR Inconsistent APS Codes* alarms. **Reference:** Task 552: Clear 'SYS50DM Circuit Pack Failure'
NO,	continue with next step.

4 Click on the **Update Alarms** button.

5 Is the same *BLSR Improper APS Codes* alarm still displayed in the Alarm List?

If...	**Then...**
YES	escalate to the next higher level of technical support.
NO,	*STOP! End of Task*.

Task 526: Clear Default K-bytes Alarm

Purpose

Use this procedure to address a *Default K-bytes* alarm.

Required equipment

Use the WaveStar® Craft Interface Terminal (CIT) to complete this task:

Related information

For related information, see Chapter 2, “Maintenance/Trouble-Clearing” in this document.

> **Important!** This alarm (when present) indicates that protection switching is unavailable.

Default k-bytes alarm occurrence

This alarm is issued when the received K-bytes source node ID is equal to the destination node ID.

Common reasons for occurrence

This alarm may occur more frequently when:

- Adding or deleting nodes from a ring
- Power sequencing a node
- Ring Protection modes are not provisioned the same at all nodes.

This alarm may also occur when performing certain ring maintenance tasks.

Most common solutions

This alarm should clear itself after all of the node’s ring maps have been updated to reflect the most recent addition/removal of node(s) within the ring and after all nodes in the ring have been powered up.

Task

Use the following steps to address a *Default K-bytes* alarm.

1 Check and clear accompanying alarms.

> **Important!** The system may automatically correct for this error condition and will, after a brief time interval, restore itself to normal processing activities. If this does not occur, contact your next level of technical support.

Reference: T 516, T 528, T 529, T 530, T 531

ND OF STEPS

Task 529: Clear ‘Duplicate Ring Node’

Purpose

Use this task to clear a *Duplicate Ring Node* alarm.

Required equipment/ personnel

The following equipment is required in order to complete this task:

- *WaveStar*™ Craft Interface Terminal (CIT)
- On-site assistance at the node (or nodes)

Before you begin

Attention to details and conscientious efforts should prevent this alarm from ever occurring. However, instances when this alarm may occur include:

- Whenever a new node is added to an existing ring, or
- When changing the TID of an existing node.

Prior to beginning this task, make sure:

- You either have in-hand a copy of the office records for this ring, or
- You have access to office records and can determine the correct TID for every node of the ring.

Task

Complete the following steps in order to (a) identify the node that has the correct TID, and (b) change the node’s TID to the correct value.

Important! While this alarm is active, the ring cannot determine if it’s a ring map. Therefore, all ring switching is inhibited. The user should understand the severity of these issues and attach a high priority to getting this alarm cleared quickly!

1 Obtain a copy of the office records for this ring, and verify that the records are not the cause of this problem. For example, verify that a duplication of TIDs is not specified. Correct the office records as necessary.

Important! If you attempt to remotely login to one of the nodes with the duplicate TID, you generally will not know which of the two you are really communicating with. Therefore, a local/direct connection (by an on-site craft) is generally required to change/ correct the node with the incorrect TID.

2 Use local means to determine what activities have recently occurred with this ring.

Important! The source of this alarm will most likely be associated with these recent activities.

3

If...	Then...
the recent activity was to add a new node,	instruct the on-site craft to: 1. physically connect their WaveStar CIT to the new node. 2. log in to their local node using the identified TID. 3. verify that this node's TID is correct per office records. 4. as appropriate, change this TID to make it unique. **Reference:** T329 5. as appropriate, update office records.

4

If...	Then...
the recent activity was to change the TID of an existing node,	instruct the craft to: 1. physically connect their WaveStar CIT to the new node. 2. login to their local node using the identified TID. 3. verify that this node's TID is correct per office records. 4. as appropriate, change this TID to make it unique. **Reference:** T329 5. as appropriate, update office records.

5 Log in (either remotely or locally) to the node with the TID that you just changed.

6 While still logged in to the just-changed TID node, wait 2 to 10 minutes for Ring Discovery to complete, and clear the active alarms. Then verify that a new and correct ring-map has been established.

From the *System View* screen, select the following:

- **View>Rings>Ring Map**
- In the *View Ring Map* window, expand down the directory structure until the subject *RingID* is displayed
- Select (click) on the subject *RingID*
- Click on the **Select** button.
- Click on the button labeled **Display Ring Map Graph**
- Verify (visually) that the new ring-map:
  - – lists the corrected TID, and
  - – is a complete ring-map.

7 Click on the **Update Alarms** button. Is the alarm *Duplicate Ring Node* still listed?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	continue.

ND OF STEPS

Task 531: Clear 'Ring Incomplete'

Purpose

This condition indicates that the designated network element (NE) is unable to create a complete ring map because of a controller or transmission failure in the ring network.

Required privilege code(s)

The user must have a privilege code of M1 and P3 (or higher) to perform this task.

Required equipment

Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap

Related information

For related information, see:

- Office records at the network provider
- *Chapter 7, Provisioning, Security, and Administration* in the *WaveStar TDM 2.5G/10G User Operations Guide, 365-371-210*

Task

Complete the following steps to clear the *Ring Incomplete* alarm:

1 From the WaveStar CIT **System View** screen, click on the **Alarm List** button.

2 Is the alarm *Ring Incomplete* displayed in the alarm list?

If…	Then…
YES,	continue with Step 3. **Important!** When the network is in the *Ring Incomplete* state, you may not be able to perform a remote login. In this case, local assistance will be required at those nodes.
NO,	*STOP! End of Task*.

3 Is there an ADJCTL/DCC circuit pack at one of the NEs within this ring that is currently performing a reset?

If…	Then…
YES,	continue.
NO,	go to Step 6.

4 Wait two minutes for the ADJCTL/DCC to complete its reset.

5 Click on the **Alarm List** button, and go to Step 2.

6 Within this ring, is there at least one NE that is performing a system reboot?

If…	Then…
YES,	continue.
NO,	go to Step 8.

7 Wait approximately 15 minutes for the identified NE to complete its system reboot. Go to Step 5.

8 Does the updated alarm list also contain an incoming OC48/OC192 signal failure?

If…	Then…
YES,	identify the appropriate trouble-clearing task for the incoming OC48/OC192 signal failure, and perform that task so as to clear the OC48/OC192 signal failure alarm. **Reference:** T 500
NO,	continue.

9 Was a provisioning problem identified and corrected?

If…	Then…
YES,	go to Step 5. **Important!** At least one NE within the ring may have incorrect provisioning. Check the Protection Group ID, Ring ID, East and West ports, and so forth. Also, verify that the fibers are not reversed. Refer to the office records for details on this ring and to Chapter 7 for details on how to implement provisioning.
NO,	continue.

10 Consult with your next higher level of technical support.

ND OF STEPS

Task 533: Clear Circuit Pack Unequipped/Missing

Purpose

Use this procedure to clear a "Circuit Pack Unequipped/Missing" alarm.

Required privilege code

You must have at least an M1 in order to complete this task.

Required equipment/ personnel

The following are required in order to complete this task:

- *WaveStar* Craft Interface Terminal (CIT)
- Wrist strap
- the correct, coded circuit pack.

Task

Complete the following steps to clear a "Circuit Pack Unequipped/ Missing alarm".

1 From the **Alarm List**, determine the AID of the slot for the unequipped/ missing circuit pack.

> **Important!** If, for example, the AID also indicates a Pack tmg() alarm, then the alarm clearing solution is to have the on-site craft insert a tmg circuit pack into the identified slot. And, most likely, clear both alarms simultaneously.

2 Based on the information obtained in Step 1, instruct the on-site craft to obtain the needed/missing circuit pack and insert that circuit pack into the identified slot.

3 Instruct the on-site craft to inform you whenever the newly installed circuit pack gas successfully rebooted. A steady green LED is the indication of a successful reboot.

> **Important!** Normally, most circuit packs will reboot in a few seconds. A worst case time element would be 5-minutes.

4 From the *System View* screen, click on the **Update Alarms** button.

5 Does the *Alarm List* still display this same alarm?

If…	**Then…**
YES,	continue.
NO,	*Stop! End of Task.*

6 Escalate to the next higher level of technical support.

ND OF STEPS

Task 534: Clear ‘Mate Circuit Pack Unequipped Failure’

Purpose

Use this procedure to clear a *Mate Circuit Pack Unequipped Failure* alarm.

Required equipment

Use the following equipment to complete this task:

- WaveStar® Craft Interface Terminal (CIT)
- Wrist strap
- Pointer Processor circuit pack (PProcSTS192)
- OC-192 circuit pack.

Before you begin

This alarm only applies to those port units which are implemented across more than one (two) circuit packs. Currently, the two circuit packs (OC-192 and PProcSTS192) are the only ones for which this alarm may apply. This alarm may occur (normally and briefly) while either of these two circuit packs is being provisioned. However, once these circuit packs are provisioned, any subsequent circuit pack removal will result in generating a different alarm—which is known as *Circuit Pack Unequipped Failure*.

Task

Complete the following steps to clear a *Mate Circuit Pack Unequipped Failure* alarm.

Important! This alarm is raised against one of the circuit packs when only one is provisioned (correct pack is equipped) and the other is not yet provisioned (not yet equipped). As soon as both packs have been simultaneously equipped/provisioned for the first time, then the alarm is no longer produced. Subsequently, and for an in-service system, the only way to generate this alarm is to de-provision one circuit pack and not the paired circuit pack.

1 From the **Alarm List** determine the AID of the slot for the unequipped circuit pack.

Important! If, for example, the AID indicates that PProc*e* (*e* for East) does not have its mate circuit pack equipped, then the alarm clearing solution is to have the craft insert an OC-192 circuit pack in the slot labeled *tre* (e for East). On the converse, if the AID were to indicate that *tre* does not have its mate circuit pack equipped, then the alarm-clearing solution would be to have the craft insert a Pointer Processor into the slot labeled PProce.

2 Based on the information obtained in Step 1, instruct the on-site craft to obtain the needed/missing circuit pack and to insert that circuit pack into appropriate slot.

3 Instruct the on-site craft to inform you whenever the newly installed circuit pack has successfully rebooted.

Important! A successful reboot should normally complete in less than 2 minutes.

4 Click on the **Update Alarms** button.

5 Does the alarm list still include this same alarm?

If...	Then...
YES,	go to Step 6.
NO,	*STOP! End of Task.*

6 Escalate to the next higher level of technical support.

Task 543: Clear ‘OC192, OC48, or OC12, OC3, or T3 DS3 Loss of Signal’

Purpose

Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing this alarm.

Required equipment

The following is a list of required equipment for completing this procedure:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement circuit pack (OC-3 or OC-12 or OC-48, or STM1EE4, or as applicable OC-192, or DS3EC1).
- Optical power meter (to measure the received power level)
- Fiber cleaning supplies.

Optional equipment

The following is a list of equipment that the craft may need occasionally:

- OC-3/OC-12/OC-48/OC-192 transmitter/receiver test set
- Optical Time Domain Reflect-o-meter (OTDR) test set (to help locate a fiber bend or cut)
- 20-dB buildout pad (type depends on fiber connector being used)
- DS3 transmitter/receiver set (to test “electrical” signal and cable troubles)
-

Safety precautions

To assure both personal safety and the proper functioning of the WaveStar TDM 10G system, it is imperative to review and understand this precaution prior to performing this task.

CAUTION

The OBA has a maximum power output level of +17 dBm. If the far-end fiber is being fed by an OBA – then a 20-dB pad must be inserted between the OBA and the power meter. A pad is not *required in order to measure the output power level of an OC192 OUT port.*

CAUTION

This OC-12 circuit pack contains two ports. Most likely, only one port will be indicating an LOS, while the other port may be providing normal transmission. Care must be exercised to NOT disconnect the port that is not alarmed – else, service will be disrupted.

Before you begin

Before you begin this task, it is important to understand that:

- An OC-3 or OC-12 or OC-48 or OC-192 LOS condition has been detected on the identified incoming (receiver) line, or

  NOTE: Likely causes, in terms of priority, are:

  1. Failure of the upstream transmitter circuit pack
  2. Failure of the local receiver circuit pack
  3. Failure on the incoming optical path
  4. Dirty/contaminated optical connector(s).

- A T3 DS3 LOS condition has been detected on one or more of the DS3 signals from the office low-speed source (such as a DSX panel).

  NOTE: Likely causes, in terms of priority, are:

  1. Failure of the DS3 or EC1 office source
  2. Failure of the DS3 or EC1 port unit circuit pack
  3. Loose coaxial connector on the (shelf DS3EC1 connector panel or DSX panel)
  4. Failure (breakage) of the “electrical” coaxial cable

- An STM1EE4 STMLOS condition has been detected on one or more of the STM1E signals from the office low-speed source (such as an STM1E panel).

  NOTE: Likely causes, in terms of priority, are:

  1. Failure of the STM1E office source
  2. Failure of the STM1E port unit circuit pack
  3. Loose coaxial connector on the shelf STM1EE4 connector panel or STM1E panel

4. Failure (breakage) of the "electrical" coaxial cable

Task Complete the following steps to clear an *LOS* alarm.

---

1 From the WaveStar CIT **System View**, click on the **Alarm List** button.

Important! Observe the column labeled **AID** and make a note of the entry for the Loss of Signal.

A LOS alarm may or may not have one or more associated alarms. An associated alarm could be either "equipment" or "facilities". An example of an associated equipment alarm is Circuit Pack Failure. Examples of associated facilities alarms include: (a) LOS in both directions, (b) LOS on other fibers, (c) DCC Section Failure, or (d) DCC Line Failure

---

2 Refer to the Alarm List and determine whether there are associated alarms (either equipment or facilities) at the local NE?

IF ...	THEN ...
YES,	go to Step 8.
NO,	continue.

Important! Before you can determine whether associated alarms exist on the neighbor NE, it will be necessary to: (a) determine the identity of the neighbor NE, (b) determine the neighbor port's identity, (c) log in to the neighbor NE, and, (d) display that NE's alarm list.

3 From the local NE and on the CIT **System View** screen, select **Administration-OSI Neighbor Map**.

---

4 In the **Administration-OSI Neighbor Map** screen:

1. Select (highlight and click on) the **DCCEI** circuit pack.
2. Click on the **Select** button.

5 In the **Neighbor Map for subject dccei-cp**,

1. Locate the column that is labeled *Local Port* and identify the row that lists the AID from Step 1.
2. Identify the corresponding neighbor port—which is the same row but in the *Nbr Port* column.
3. Identify the corresponding neighbor name—which is the same row but in the *Nbr NE Name* column.

6 Log in to the neighbor NE.

Important! If a problem exists that prevents you from logging in to the neighbor NE, then you should: (a) have an on-site craft physically connect to the subject NE, (b) have the craft log in to that NE, and (c) display the **Alarm List**.

7 Are there associated alarms with the remote/neighbor NE?

IF ...	THEN ...
YES,	continue.
NO,	go to Step 11.

8 Is the alarm equipment related?

IF ...	THEN ...
YES,	continue.
NO,	the alarm must be facilities-related. Continue with Step 10.

9

IF the equipment alarm is…	THEN continue with…
OC-192/STM64, Circuit Pack Failure	Task **Reference:** Task 564: Clear ‘OC192/STM64 Circuit Pack Failure’

IF the equipment alarm is…	THEN continue with…
OC-48/STM16, Circuit Pack Failure	Task **Reference:** Task 548: Clear ‘OC48/ STM16 Circuit Pack Failure’
OC-12/STM4, Circuit Pack Failure	Task **Reference:** Task 549: Clear ‘OC12/ STM4 Circuit Pack Failure’
OC-3/STM1, Circuit Pack Failure	Task **Reference:** Task 550: Clear ‘OC3/ STM1 Circuit Pack Failure’
DS3/EC1, Circuit Pack Failure	Task “Task 547: Clear ‘DS3EC1/8 Circuit Pack Failure’” (-1)
1GE, Circuit Pack Failure	Task **Reference:** Clear: ‘1GE Circuit Pack Failure’

10 Does the Alarm List include multiple LOS/STMLOS alarms?

IF …	THEN …
YES,	refer to your local procedures for reporting and repairing optical facility (or path) troubles. **STOP! End of Task**.
NO,	just the single LOS/STMLOS alarm. Continue.

11

IF the local NE Alarm List display includes…	THEN continue with…
OC192, Loss of Signal	Supporting Element **Reference:** “SE 543-1: Clear ‘OC192/ STM64, Loss of Signal’” (-7)
OC48, Loss of Signal	Supporting Element **Reference:** “SE 543-2: Clear ‘OC48/ STM16, Loss of Signal’” (-12)

IF the local NE Alarm List display includes…	THEN continue with…
OC12, Loss of Signal	Supporting Element **Reference:** "SE 543-3: Clear 'OC12, LOS/STM4 Loss of Signal'" (-17)
OC3, Loss of Signal	Supporting Element **Reference:** "SE 543-4: Clear 'OC3/ STM1, Loss of Signal'" (-28)
T3 DS3, Loss of Signal	Supporting Element **Reference:** "SE 543-5: Clear 'T3 DS3/ EC1 Loss of Signal'" (-39)
1GE, Loss of Signal	Supporting Element **Reference:** SE 543-6: Clear 1GE Loss of Signal

12 **STOP! End of Task**.

SE 543-1: Clear ‘OC192/STM64, Loss of Signal’

Task Perform the steps below to clear an *OC192 LOS/STMLOS* alarm.

1 Determine whether the near-end node is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

Reference: Task 712: Measure Received Optical Power

2 Is the power level within proper limits for this particular type of circuit pack?

IF …	THEN …
YES,	continue.
NO,	reconnect the IN fiber connector and then go to Step 9.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be a defective near-end circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, replace the near-end circuit pack.

3 Instruct the on-site craft to re-connect the fiber to the circuit pack’s IN connector.

4 At the near-end node, click on the **Update Alarms** button.

5 Does the Alarm List still display the same LOS/STMLOS?

IF …	THEN …
YES,	continue.
NO,	**STOP! End of Supporting Element**.

6 Instruct the on-site craft to replace the receiver (OC192 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned, whether the connector is known to be causing a problem or not, before re-connection

Reference: Task 703: Clean Optical Fibers and Connectors

7 At the near-end node, click on the **Update Alarms** button.

8 Does the Alarm List still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate to your next higher level of technical support.
NO,	**STOP! End of Supporting Element**.

9 From the *System View* screen:

1. `Select File-NE Disconnect.`
2. Click on the **YES** button in order to disconnect from the near-end NE.

10 Log in to the far-end NE.

11 From the System View screen click on the Alarm List button.

12 For the subject AID, does the Alarm List include a Probable Cause listing for the ALS alarm?

IF ...	THEN ...
YES,	clear that alarm (now). See Task 572.
NO,	continue.

13 From the *System View* screen, select `View-View Equipment Details` and then expand down the directory structure so as to determine whether the facility (AID) is powered by an OBA.

14 Does the far-end link include an OBA?

IF …	THEN …
YES,	go to Step 23.
NO,	continue.

15 Instruct the far-end on-site craft to measure the transmit (OUT) power level for the OC192.

Reference: Task 712: Measure Received Optical Power

16 Is the power level within proper limits for this particular type of circuit pack?

IF …	THEN …
YES,	a problem exists with the fiber. Escalate to your facilities repair group. **STOP! End of Supporting Element**.
NO,	continue.

17 Instruct the far-end on-site craft to replace the transmitter (OC192 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before re-connection, whether or not the connector is known to be causing a problem.

Reference: Task 703: Clean Optical Fibers and Connectors

18 From the System View screen:

1. Select `File-NE Disconnect`.
2. Click on the **YES** button in order to disconnect from the far-end NE.

19 Login to the near-end NE.

20 From the *System View* screen, click on the **Alarm List** button.

21 Does the Alarm List still display the same LOS/STMLOS?

IF …	THEN …
YES,	continue.
NO,	**STOP! End of Supporting Element**

22 Escalate to the next higher level of technical support.

CAUTION

The OBA has a maximum power output level of +17dbm. If the far-end fiber is being fed by an OBA - then a 20db pad must be inserted between the OBA and the power meter. A pad is not required in order to measure the output power level of an OC192 OUT port.

23 Instruct the far-end on-site craft to measure the output power level at the transmit port of the OBA.

Reference: Task 712: Measure Received Optical Power

24 Is the power level within proper limits for this OBA?

IF …	THEN …
YES,	If YES, then there exists a problem with the fiber. Escalate to your facilities repair group. **Stop! End of Supporting Element**.
NO,	continue.

25 Instruct the far-end on-site craft to measure the power level at the OUT port of the OC192.

26 Is the power level within proper limits for this particular type of OC192 circuit pack?

IF …	THEN …
YES,	replace the OBA and afterwards go to Step 18.
NO,	go to Step 17.

ND OF STEPS

SE 543-2: Clear 'OC48/STM16, Loss of Signal'

Task Perform the steps below to clear an *OC48 LOS/STMLOS* alarm.

1 Determine whether the near-end node is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

Reference: Task 712: Measure Received Optical Power

2 Is the power level within proper limits for this particular type of circuit pack?

IF ...	THEN ...
YES,	continue.
NO,	reconnect the IN fiber connector and then go to Step 9.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be a defective near-end circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, replace the near-end circuit pack.

3 Instruct the on-site craft to reconnect the fiber to the circuit pack's IN connector.

4 At the near-end node, click on the **Update Alarms** button.

5 Does the Alarm List still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	continue.
NO,	**STOP! End of Supporting Element**.

6 Instruct the on-site craft to replace the receiver (OC48 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before re-condition, whether or not the connector is known to be causing a problem.

Reference: Task 703: Clean Optical Fibers and Connectors

7 At the near-end node, click on the **Update Alarms** button.

8 Does the Alarm List still display the same LOS/STMLOS?

IF …	THEN …
YES,	escalate to your next higher level of technical support.
NO,	**STOP! End of Supporting Element**.

9 From the *System View* screen:

1. Select `File-NE Disconnect`.
2. Click on the **YES** button in order to disconnect from the near-end NE.

10 Log in to the far-end NE.

11 From the *System View* screen, click on the **Alarm List** button.

12 For the subject AID, does the Alarm List include a Probable Cause listing for the ALS alarm?

IF …	THEN …
YES,	clear that alarm (now). **Reference:** Task 572: Clear ALS (Automatic Laser Shutdown)
NO,	continue.

13 From the *System View* screen, select `View-View Equipment Details` and then expand down the directory structure so as to determine whether the facility (AID) is powered by an OBA.

14 Does the far-end link include an OBA?

IF …	THEN …
YES,	go to Step 23.
NO,	continue.

15 Instruct the far-end on-site craft to measure the transmit (OUT) power level for the OC48.

Reference: Task 712: Measure Received Optical Power

16 Is the power level within proper limits for this particular type of circuit pack?

IF …	THEN…
YES,	a problem exists with the fiber. Escalate to your facilities repair group. **STOP! End of Supporting Element**.
NO,	continue.

Important! Each fiber connection/fiber connector should always be cleaned before re-connection, whether or not the connector is known to be causing a problem.

17 Instruct the far-end on-site craft to replace the transmitter (OC48 circuit pack).

Reference: Task 703: Clean Optical Fibers and Connectors

18 From the *System View* screen:

1. Select `File-NE Disconnect`.
2. Click on the **YES** button in order to disconnect from the far-end NE.

19 Log in to the near-end NE.

20 From the *System View* screen, click on the **Alarm List** button.

21 Does the Alarm List still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	continue.
NO,	**STOP! End of Supporting Element**

22 Escalate to the next higher level of technical support.

CAUTION

The OBA has a maximum power level of +17dbm. If the far-end is being fed by an OBA- then a 20db pad must be inserted between the OBA and the power meter. A pad is not required in order to measure the output power level of an OC OUT port.

23 Instruct the far-end on-site craft to measure the output power level at the transmit port of the OBA.

Reference: Task 712: Measure Received Optical Power

24 Is the power level within proper limits for this OBA?

IF ...	THEN ...
YES,	a problem exists with the fiber. Escalate to your facilities repair group. **STOP! End of Supporting Element**.
NO,	continue.

25 Instruct the far-end on-site craft to measure the power level at the OUT port of the OC48.

26 Is the power level within proper limits for this particular type of OC48 circuit pack?

IF ...	THEN ...
YES,	replace the OBA, and afterwards go to Step 18.
NO,	go to Step 17.

ND OF STEPS

SE 543-3: Clear ‘OC12, LOS/STM4 Loss of Signal’

Task Perform the steps below to clear an *OC12 LOS/STMLOS* alarm.

1 Determine whether the near-end node is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

Reference: Task 712: Measure Received Optical Power

CAUTION

This OC-12 circuit pack contains two ports. Most likely, only one port will be indicating a LOS while the other port may be providing normal transmission. Care must be exercised to NOT disconnect the port that is not alarmed - else, service may be disrupted. The “service may be disrupted” actually depends on: (a) whether the non-alarmed port is part of a 1+1 protection group, and (b) whether the protection port is available.

2 Is the power level within proper limits for this particular type of circuit pack?

IF…	THEN…
YES,	continue.
NO,	reconnect the IN fiber connector and then go to Step 23.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be (a) dirty / defective attenuator pad, or (b) defective near-end circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, remove and replace the attenuator from the current circuit pack with a known good same type attenuator. Third, and again only as necessary, replace the near-end circuit pack.

3 Instruct the on-site craft to reconnect the fiber to the circuit pack's IN connector.

4 At the near-end node, click on the **Update Alarms** button.

5 Does the **Alarm List** still display the same LOS/STMLOS?

IF…	THEN…
YES,	continue.
NO,	**STOP! End of Supporting Element.**

6 Instruct the on-site craft to remove the attenuator from the circuit pack and replace with the same type attenuator.

7 At the near-end node, click on the **Update Alarms** button.

8 Does the Alarm List still display the same LOS/STMLOS?

IF…	THEN…
YES,	continue.
NO,	**Stop! End of Supporting Element**.

9 Determine whether the non-alarmed port is carrying traffic.

Important! If the non-alarmed port is part of a protection group - then it will be necessary to determine which facility (working or protection) is currently carrying traffic. If the non-alarmed port is unprotected - then it will be necessary to determine if it is carrying traffic; for example, determine if there exists a cross connection for the unprotected port.

From the System view screen and for the subject AID (slot):

1. Place the cursor over the non-alarmed port.

2. Pause for 5-seconds until a tool-tip on that port is displayed.
3. Determine whether the non-alarmed port is:

1) Working (wkg). For example, the AID of a 1+1 protection port may look something like Port 1 (OC12, 1+1 o02, wkg 1).

2) Protection (wkg). For example, the AID of a 1+1 protection port may look something like Port 1 (OC12, 1+1 o02, ptn 1). Or.

3) Unprotected. (wkg). For example, the AID of an unprotected port may look something like Port 1 (OC12, Unprotected).

10

IF the non-alarmed port is …	**THEN …**
part of a 1+1 protection group, either wkg or ptn,	1. right-click on that port 2. select drop-down item **View Protection** 3. in the pop-up screen **View Protection for Port_(OC12, 1+1, __,__ __)** and under the box that is labeled **Switch Status** determine which po9rt (wkg or ptn) is listed as being the **Active Port**.
unprotected,	1. right-click on that port 2. select drop-down item **View Cross Connections** 3. follow the on-screen instructions and determine whether a cross-connection exists for the subject AID.

11

IF the non-alarmed port is ...	**THEN ...**
part of a 1+1 port protection group and is NOT carrying traffic (NOT the Active Port)	continue with Step 17.
part of a 1+1 port protection group and is carrying traffic (is the Active Port)	continue with Step 21.
unprotected and is NOT carrying traffic	continue with Step 17.
unprotected and is carrying traffic	continue with Step 12.

12

Important! Before the OC-12 circuit pack can be replaced it will first be necessary to "Bridge & Roll" traffic from the port that is still providing service.

Use local procedures in order to identify ports that are to be used in this Bridge & Roll service from the port that is still carrying traffic to the alternate port.

Reference: Task 344 in the UOG

13 At the near-end node, instruct the on-site craft to replace the receiver (OC-12 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before re-connection, whether or not the connector is known to be causing a problem before re-connecting.

Reference: Task 700 and Task 703.

14 Return the service, that was bridged and rolled in Step 12, to it's original port on this newly installed circuit pack.

Stop! End of Supporting Element.

15 At the near-end node, click on the **Update Alarms** button.

16 Does the Alarm List still display the same LOS/STMLOS?

IF …	THEN …
YES,	escalate to your next higher level of technical support.
NO,	**Stop! End of Supporting Element**.

17 At the near-end node, instruct the on-site craft to replace the receiver (OC-12 circuit pack).

Important! As necessary, refer to vendor supplied documentation pertaining to that NE.

Each fiber connection/fiber connector should always be cleaned, whether the connector is known to be causing a problem or not, before re-connecting.

Reference: Task 703

18 At the near-end node, click on the **Update Alarms** button.

19 Does the Alarm List still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate to your next higher level of technical support.
NO,	continue.

20 From the *Shelf View* screen:

1. move your cursor over the subject AID
2. right-click and select item *Protection Switch*
3. in the field labeled *Switch Type* select **Clear**
4. click on the **OK** button

5. click on the **YES** button
6. **Stop! End of Supporting Element**.

21

IF the non-alarmed port is ...	THEN ...
wkg (as determined from Step 9)	1. move your curser over the non-alarmed port and right-click 2. select drop-down item Protection Switch 3. select Manual to Protection 4. click on the OK button 5. click YES to the information message
pan (as determined from Step 9)	1. move your cursor over the non-alarmed port and right-click 2. select drop-down item Protection Switch 3. select Manual to Working 4. click the OK button 5. click YES to the information message.

22 Go to Step 17.

23 Determine whether the far-end is transmitting the proper signal level. Instruct the far-end on-site craft to measure the transmit (OUT) power level.

Reference: Task 712

24 Is the power level within proper limits of this particular type of circuit pack.

IF ...	THEN ...
YES,	continue.
NO,	go to Step 28.

25

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be trouble with the optical facility. First, determine whether the problem was a dirty fiber connector. Second, and only as necessary, escalate the trouble to the group that is responsible for the optical facility.

Instruct the far-end on-site craft to re-connect the fiber to the circuit pack's OUT connector.

26 At the near-end node, click on the **Update Alarms** button.

27 Does the Alarm List still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate the problem to the person/group that is responsible for repairing the optical facility.
NO,	**Stop! End of Supporting Element**.

28 Login to the far-end NE and display the *Shelf View* screen.

29 Determine whether the far-end OC12's associated port is carrying traffic.

Important! If the associated port is part of a protection group - then it will be necessary to determine which facility (working or protection) is currently carrying traffic. If the associated port is unprotected - then it will be necessary to determine if it is carrying traffic; for example, determine if there exists a cross connection for the unprotected port.

From the *Shelf View* screen and for the subject AID (slot):

1. place the cursor over the associated port
2. pause for 5-seconds until a tool-tip on that port is displayed
3. determine whether the associated port is:

- Working (wkg). For example, the AID of a 1+1 protected port may look something like **Port 1 (OC12, 1+1 o02, wkg 1)**
- Protection (ptn). For example, the AID of a 1+1 protected port may look something like **Port 1 (OC12, 1+1 o02, ptn 1)**. Or.
- Unprotected. For example, the AID of an unprotected port may look something like **Port 1 (OC12, Unprotected)**.

30

IF the associated port is ...	**THEN ...**
part of a 1+1 protection group, either wkg or ptn.	1. right-click on that port 2. select drop-down item **View Protection** 3. in the pop-up screen **View Protection** for **Port_(OC12,1+1,__,__ _)** and under the box that is labeled **Switch Status** determine which port (wkg or ptn) is listed as being the **Active Port**.
unprotected	1. right-click on that port 2. select drop-down item View Cross Connections 3. follow the on-screen instructions and determine whether a cross connection exists for the subject AID.

31

IF the associate port is ...	**THEN ...**
part of a 1+1 port protection group and is NOT carrying traffic (NOT the Active Port)	continue with Step 37.
part of a 1+1 port protection group and is carrying traffic	continue with Step 41.
unprotected and is NOT carrying traffic	continue with Step 37
unprotected and is carrying traffic	continue with Step 32.

Important! Before the OC-12 circuit pack can be replaced it will first be necessary to “Bridge & Roll” traffic from the port that is still providing service.

32 Use local procedures in order to identify ports that are to be used in this Bridge and Roll task. Bridge & Roll service from the port that is still carrying traffic to the alternate port.

Reference: Task 344 in the UOG

33 At the far-end node, instruct the on-site craft to replace the receiver (OC-12 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned, whether the connector is known to be causing a problem or not, before re-connecting.

Reference: Task 700 and Task 703

34 Return the service, that was bridged and rolled in Step 32, to it’s original port on this newly installed circuit pack.

35 At the near-end node, click on the **Update Alarms** button.

36 Does the **Alarm List** still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate to your next higher level of technical support.
NO,	**Stop! End of Supporting Element**.

37 At the far-end node, instruct the on-site craft to replace the receiver (OC-12 circuit pack).

Important! As necessary, refer to vendor supplied documentation pertaining to that NE.

Each fiber connection/fiber connector should always be cleaned, whether the connector is known to be causing a problem or not, before re-connecting.

Reference: Task 700 and Task 703

38 At the far-end node, click on the **Update Alarms** button.

39 Does the **Alarm List** still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate to your next higher level of technical support.
NO,	continue.

40 From the *Shelf View* screen:

1. move your cursor over the subject AID
2. right-click and select item *Protection Switch*
3. in the field labeled *Switch Type* select **Clear**
4. click on the **OK** button
5. click on the **YES** button
6. **Stop! End of Supporting Element**.

41

IF the associated port is ...	THEN ...
wkg (as determined from Step 30)	1. move your cursor over the non-alarmed port and right-click 2. select drop-down item **Protection Switch** 3. select **Manual to Protection** 4. click the **OK** button 5. click **YES** to the information message

IF the associated port is ...	THEN ...
ptn (as determined from Step 30)	1. move your cursor over the non-alarmed port and right-click 2. select drop-down item **Protection Switch** 3. select **Manual to Working** 4. click the **OK** button 5. click **YES** to the information message.

42 Go to Step 37.

N D O F S T E P S

SE 543-4: Clear ‘OC3/STM1, Loss of Signal’

Task Perform the steps below to clear an *OC3 LOS/STMLOS* alarm.

1 Determine whether the near-end node is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

Reference: Task 712: Measure Received Optical Power

CAUTION

Depending on the type of OC-3 circuit pack - it will contain either 4 or 8 ports. Most likely, only one port will be indicating a LOS while the other ports may be providing normal transmission. Care must be exercised to NOT disconnect the ports that are not alarmed - else, service may be disrupted. The “service may be disrupted” actually depends on: (a) whether the remaining non-alarmed ports are each part of a 1+1 protection group, and (b) whether their respective protection ports are available.

2 Is the power level within proper limits for this particular type of circuit pack?

IF …	THEN …
YES,	continue.
NO,	reconnect the IN fiber connector and then go to Step 23.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be (a) dirty/ defective attenuator pad, or (b) defective near-end circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, remove and replace the attenuator from the current circuit pack with a known good same type attenuator. Third, and again only as necessary, replace the near-end circuit pack.

3 Instruct the on-site craft to reconnect the fiber to the circuit pack's IN connector.

4 At the near-end node, click on the **Update Alarms** button.

5 Does the Alarm List still display the same LOS/STMLOS?

IF …	THEN …
YES,	continue.
NO,	**STOP! End of Supporting Element**.

6 Instruct the on-site craft to remove the attenuator from the circuit pack and replace with the same type attenuator.

7 At the near-end node, click on the **Update Alarms** button.

8 Does the Alarm List still display the same LOS/STMLOS?

IF …	THEN …
YES,	continue.
NO,	**Stop! End of Supporting Element**.

Important! Each non-alarmed port (which is part of a protection group) must be checked to determine whether it is carrying traffic; for example, determine if there exists a cross connection for the unprotected port. The suggested order is to begin with the lowest numbered non-alarmed port and continue sequentially through the highest numbered non-alarmed port.

9 From the *System View* screen and for the subject AID (slot).

1. Place the cursor over the non-alarmed port.
2. Pause for 5-seconds until a tool-tip on that port is displayed.
3. Determine whether the non-alarmed port is:
   - Working (wkg). For example, the AID of a 1+1 protection port may look something like **Port 1 (OC3, 1+1 o02, wkg 1)**.
   - Protection (ptn). For example, the AID of a 1+1 protection port may look something like **Port 1 (OC3, 1+1, o02, ptn1)**.
   - Unprotected. For example, the AID of an unprotected port may look something like **Port 1 (OC3, Unprotected)**.

10

IF the non-alarmed port is …	THEN …
part of a 1+1 protection group, either wkg or ptn.	1. right-click on that port 2. select drop-down item **View Protection** 3. in the pop-up screen **View Protection for Port_(OC3, 1+1,_,_ _)** and under the box that is labeled Switch Status determine which port (wkg or ptn) is listed as being the **Active Port**.
unprotected,	1. right-click on that port 2. select drop-down item **View Cross Connections** 3. follow the on-screen instructions and determine whether a cross-connection exists for the subject AID.

11

IF the non-alarmed port is ...	THEN ...
part of a 1+1 port protection group and is NOT carrying traffic (NOT the Active Port)	continue with Step 17.
part of a 1+1 port protection group and is carrying traffic (is an Active Port)	continue with Step 21.
unprotected and is NOT carrying traffic	continue with Step 17.
unprotected and is carrying traffic	continue with Step 12.

Important! Before the OC-3 circuit pack can be replaced, it will first be necessary to "Bridge & Roll" traffic from the port that is still providing service.

12 Use local procedures in order to identify ports that are to be used in this Bridge & Roll service from the port that is still carrying traffic to the alternate port.

Reference: Task 344 in the UOG

13 Have all non-alarmed ports been checked to determine whether on not they are carrying traffic?

IF ...	THEN ...
YES,	continue.
NO,	select the next sequential port number and continue with Step 9.

14 At the near-end node, instruct the on-site craft to replace the transmitter (OC-3 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before re-connection, whether or not the connector is known to be causing a problem before re-connecting.

Reference: Task 700 and Task 703.

15 Return the service (Roll), that was bridged and rolled in Steps 9 through 13, to it's original port on this newly installed circuit pack.

16 At the near-end node and from the *System View* screen select the **Update Alarms** button and determine whether the Alarm List still displays the same LOS/STMLOS?

IF …	THEN …
YES,	escalate to your next higher level of technical support.
NO,	**STOP! End of Supporting Element**.

17 At the near-end node, instruct the on-site craft to replace the receiver (OC-3 circuit pack).

Important! As necessary, refer to vendor supplied documentation pertaining to that NE.

Each fiber connection/fiber connector should always be cleaned, whether the connector is known to be causing a problem or not, before re-connecting.

Reference: Task 703

18 At the near-end node, click on the **Update Alarms** button.

19 Does the Alarm List still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate to your next higher level of technical support.
NO,	continue.

20 From the *Shelf View* screen:

1. move your cursor over the subject AID
2. right-click and select item *Protection Switch*
3. in the field labeled *Switch Type* select Clear
4. click on the **OK** button.
5. click on the **YES** button
6. **Stop! End of Supporting Element.**

21

IF the non-alarmed port is ...	THEN ...
wkg (as determined from Step 9)	1. move your cursor over the non-alarmed port and right-click 2. select drop-down item **Protection Switch** 3. select **Manual to Protection** 4. click on the **OK** button 5. click **YES** to the information message.
ptn (as determined from Step 9)	1. move your cursor over the non-alarmed port and right-click 2. select drop-down item **Protection Switch** 3. select **Manual to Working** 4. click the **OK** button 5. click **YES** to the information message.

22 Go to Step 17.

23 Determine whether the far-end is transmitting the proper signal level. Instruct the far-end on-site craft to measure the transmit (OUT) power level.

Reference: Task 712

24 Is the power level within proper limits of this particular type of circuit pack?

IF ...	THEN ...
YES,	continue.
NO,	go to Step 28.

25

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be trouble with the optical facility. First, determine whether the problem was a dirty fiber connector. Second, and only as necessary, escalate the trouble to the group that is responsible for the optical facility.

Instruct the far-end on-site craft to re-connect the fiber to the circuit pack's OUT connector.

26 At the near-end node, click on the **Update Alarms** button.

27 Does the Alarm List still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate the problem to the person/group that is responsible for repairing the optical facility.
NO,	**Stop! End of Supporting Element**.

28 Login to the far-end NE and display the *Shelf View* screen.

29 Determine whether the far-end OC-3's associated ports are carrying traffic.

Important! Each non-alarmed port (which is part of a protection group) must be checked to determine whether it is carrying traffic; for example, determine if there exists a cross connection for the unprotected port. The suggested order is to begin with the lowest numbered non-alarmed port and continue sequentially through the highest numbered non-alarmed port.

From the *Shelf View* screen and for the subject AID (slot):

1. place the cursor over the associate port
2. pause for 5-seconds until a tool-tip on that port is displayed
3. determine whether the associated port is:

- Working (wkg). For example, the AID of a 1+1 protected port may look something like **Port 1 (OC3, 1+1 o02, wkg 1)**
- Protection (ptn). For example, the AID of a 1+1 protected port may look something like **Port 1 (OC3, 1+1 o02, ptn 1)**. Or.
- Unprotected. For example, the AID of an unprotected port may look something like **Port 1 (OC3, Unprotected)**.

30

IF the associated port is ...	THEN ...
part of a 1+1 port protection group and is NOT carrying traffic (NOT the Active Port)	1. right-click on that port 2. select drop-down item **View Protection** 3. in the pop-up screen **View Protection** for **Port_(OC3, 1+1, __,__ _)** and under the box that is labeled Switch Status determine which port (wkg or ptn) is listed as being the **Active Port.**
unprotected	1. right-click on that port 2. select drop-down item **View Cross Connection** 3. follow the on-screen instructions and determine whether a cross connection exists for the subject AID.

31

IF the associated port is ...	THEN ...
part of a 1+1 port protection group and is NOT carrying traffic (NOT the Active Port)	continue with Step 38.
part of a 1+1 port protection group and is carrying traffic	continue with Step 42.
unprotected and is NOT carrying traffic	continue with Step 38.
unprotected and is carrying traffic	continue with Step 32.

Important! Before the OC-3 circuit pack can be replaced it will first be necessary to “Bridge & Roll traffic from the port that is still providing service.

32 Use local procedures in order to identify ports that are to be used in this Bridge & Roll task. Bridge & Roll service from the port that is still carrying traffic to the alternate port.

Reference: Task 344 in the UOG

33 Have all non-alarmed ports been checked to determine whether or not they are carrying traffic?

IF ...	THEN ...
YES,	continue.
NO,	select the next sequential port number and continue with Step 29.

34 At the far-end node, instruct the on-site craft to replace the receiver (OC-3 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned, whether the connector is known to be causing a problem or not before re-connecting.

Reference: Task 700 and Task 703

---

35 Return the ALL service to ALL ports, that were bridged and rolled in Step 32, to its original port on this newly installed circuit pack.

---

36 At the near-end node, click on the **Update Alarms** button.

---

37 Does the Alarm List still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate to your next higher level of technical support.
NO,	**Stop! End of Supporting Element**.

---

38 At the far-end node, instruct the on-site craft to replace the receiver OC-3 circuit pack).

Important! As necessary, refer to vendor supplied documentation pertaining to that NE.

Each fiber connection/fiber connector should always be cleaned, whether the connector is known to be causing a problem or not, before re-connecting.

Reference: Task 700 and Task 703

---

39 At the far-end node, click on the **Update Alarms** button.

---

40 Does the **Alarm List** still display the same LOS/STMLOS?

IF ...	THEN ...
YES,	escalate to your next higher level of technical support.

IF ...	THEN ...
NO,	continue.

41 From the *Shelf View* screen:

1. move your cursor over the subject AID
2. right-click and select item *Protection Switch*
3. in the field labeled *Switch Type* select **Clear**
4. click on the **OK** button
5. click on the **YES** button
6. **Stop! End of Supporting Element**.

42

IF the associated port is ...	THEN ...
wkg (as determined from Step 30)	1. move your cursor over the non-alarmed port and right-click 2. select drop-down item **Protection Switch** 3. select **Manual to Protection** 4. click the **OK** button 5. click **YES** to the information message.
ptn (as determined from Step 30)	1. move your cursor over the non-alarmed port and right-click 2. select drop-down item **Protection Switch** 3. select **Manual to Working** 4. click the **OK** button 5. click **YES** to the information message.

43 Go to Step 38.

N D O F S T E P S

SE 543-5: Clear ‘T3 DS3/EC1 Loss of Signal’

Task Perform the steps below to clear a ‘T3 DS3/EC1 LOS’ alarm.

Important! During port provisioning if a port’s alarm monitoring state is MON, then it is not unusual for it to generate a T3 DS3/EC1 LOS alarm. Generally, whenever all NE-to-NE provisioning is completed and correct, the LOS alarm will automatically clear.

During normal operations the occurrence of a T3 DS3/EC1 LOS alarm will usually indicate that your receive port on the DS3EC1/8 circuit pack detected an incoming failure from the DSX connector panel.

1 Instruct the on-site craft to visually inspect the incoming coaxial cable(s) and their associated connector(s) and to correct any (or all) identified problems.

2 On the near-end NE, click on the **Update Alarms** button.

3 Is the same LOS still included in the list?

IF ...	THEN ...
YES,	continue with Step 4.
NO,	**STOP! End of Supporting Element**.

Important! DS3/EC1 electrical signals can be tested using a DS3 transmitter/receiver test set.

4 Instruct the on-site craft to:

1. Disconnect the subject coaxial cable from the NE’s DS3 connector panel.
2. Connect the DS3/EC1 transmitter/receiver test set to the subject connector on the NE’s DS3/EC1 connector panel.

3. Program the test set to insert (transmit) a good DS3 signal.

5 On the near-end NE, click on the **Update Alarms** button.

6 Is the same LOS still included in the list?

IF ...	THEN ...
YES,	continue with Step 7.
NO,	go to Step 11.

7 Instruct the near-end NE's on-site craft to replace the receiver (DS3/EC1 circuit pack).

8 On the near-end NE, left-click on the **Update Alarms** button.

9 Is the same LOS still included in the list?

IF ...	THEN ...
YES,	continue with Step 10.
NO,	**STOP! End of Supporting Element**.

10 Escalate to the next higher level of technical support.

Important! The problem has been determined to be external to the NE. Thus, it is (a) within the cabling that runs from the DS3/EC1 connector panel to the DSX panel, or (b) between the DSX panel and the upstream office.

11 Instruct the on-site craft to:

1. Disconnect the DS3/EC1 transmitter/receiver from the DS3/EC1 connector panel (LOS will again appear).
2. Reconnect the original coaxial cable back to the subject connector on the DS3/EC1 connector panel.

3. Disconnect the subject cable at the DSX panel.
4. Reconnect the subject to the DS3/EC1 transmitter/receiver test set.
5. Program the test set to insert (transmit) a good DS3/EC1 signal.

12 On the near-end NE, click on the **Update Alarms** button.

13 Is the same LOS still included in the list?

IF ...	THEN ...
YES,	continue with Step 14.
NO,	the problem is external to the office. Refer to the office records and consult with the far-end NE crafts person as necessary. **STOP! End of Supporting Element**.

14 Instruct the on-site craft to disconnect the subject coaxial cable between the DS3/EC1 connector panel and the test set/DSX panel and to replace it with a known good cable.

ND OF STEPS

SE 543-6: Clear 1GE Loss of Signal

Task Perform the steps below to clear a ‘*1GE LOS*’ alarm.

1 Information is not available at the time that this document was published.

N D O F S T E P S

Task 544: How to Eject an NVM Card from an Out-of-Service Circuit Pack

Purpose

Use this procedure ONLY for those circumstances where (a) the SYS50DM circuit pack WILL NOT boot up, or (b) the NVM will not eject using the software eject routine!

Required equipment

Use the following equipment to complete this task:

- Wrist strap
- Nonconductive sturdy plastic (or wood) pointed stick/object.

Admonishments

To assure both personal safety and the proper functioning of the WaveStar® TDM 2.5G (OC-48)/10G (OC-192) system, it is imperative to review and understand these warnings and precautions prior to performing this task.

CAUTION

Excessive force can result in damage to the mechanical eject mechanism.

Task

Complete the following steps to remove an NVM card from a defective circuit pack.

1 Physically remove the defective circuit pack (SYS50DM) from the shelf.

2 Insert a sturdy object, such as the tip of a mechanical pencil, into the small tab (which has an eyelet). Refer to Figure 544-1, “SYS50DM with PCMCIA Card Inserted” (-2).

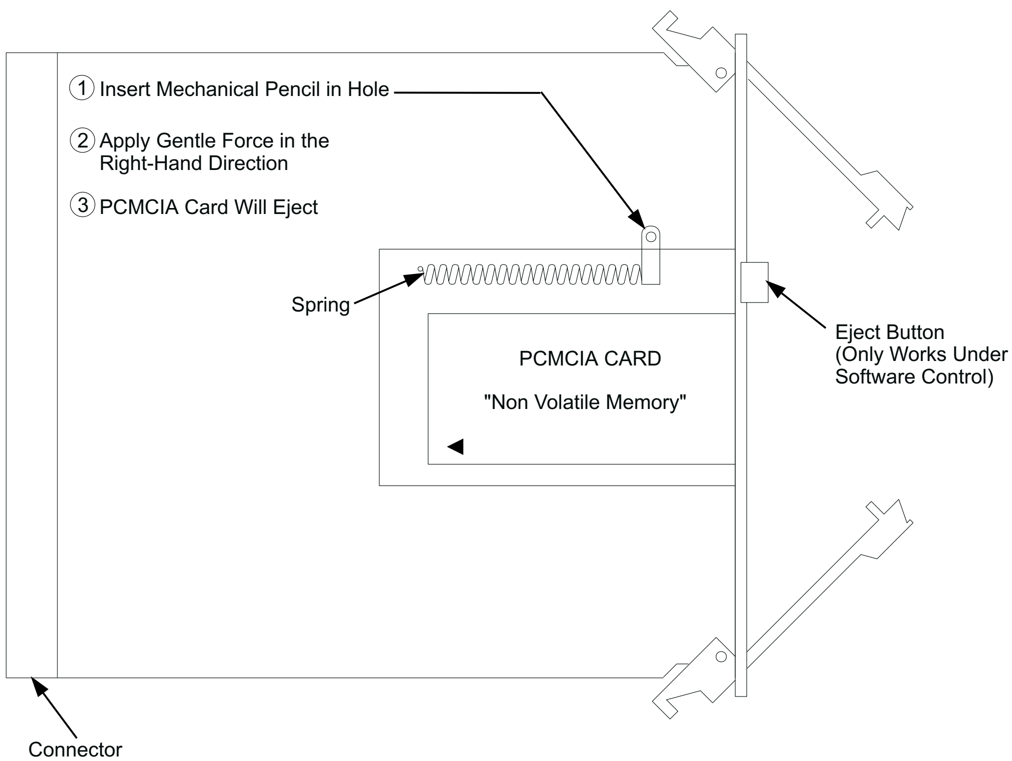
3 As appropriate, if the desire is to insert the previously removed PCMCIA card into another powered-up and already booted circuit pack, then refer to the task *Insert an NVM Card*.

Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

N D O F S T E P S

SYS50DM with PCMCIA Card Inserted

Figure 544-1 SYS50DM with PCMCIA Card Inserted



Task 545: Clear ‘OC192, OC48, OC12, OC3, or T3 DS3 Loss of Frame’

Purpose

Use this task to localize the problem, identify its cause, and implement the correction which results in clearing this alarm.

Required equipment

Use the following equipment to complete this task:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap
- DS3 transmitter/receiver set (to test “electrical” signal and cable troubles)
- Spare/replacement circuit pack (OC-3 or OC-12 or OC-12, OC-48, or as applicable OC-192,, or DS3EC1)
- Fiber cleaning supplies.

Optional equipment

The following is a list of optional equipment required to complete this task:

- Optical power meter (to measure the received power level)
- OC-12, OC-3/OC-12/OC-48, or OC-192 SONET transmitter/ receiver test set
- Optical time domain reflect-o-meter (OTDR) test set (to help locate a fiber bend or cut).

Figures

Figure 545-2 Near-End and Far-End NEs with Intermediate Transport Equipment

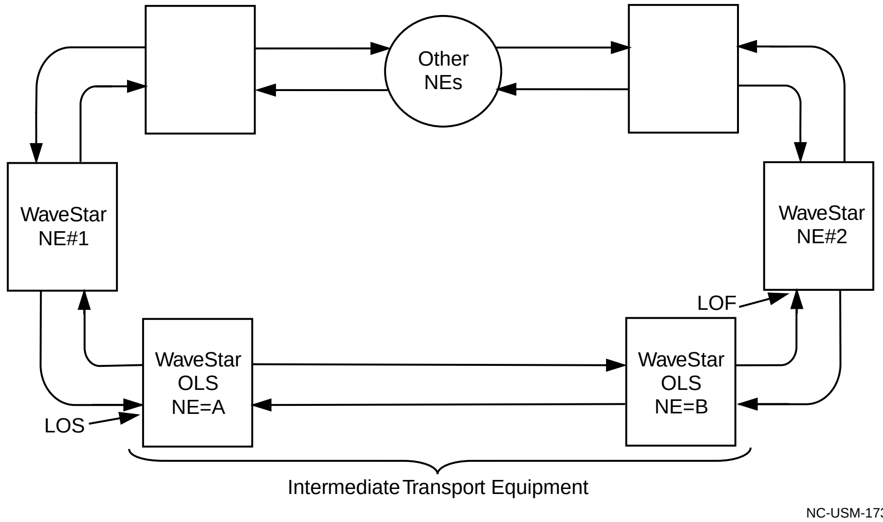
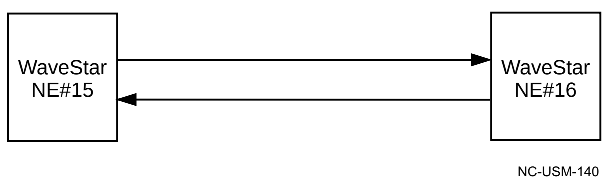


Figure TY-3 Near-End and Far-End NEs without Intermediate Transport Equipment



Before you begin Before you begin this task, it is important to understand that an LOF, in its pure and simple form, is the result of either: (a) a bad transmitter on the far-end NE, or (b) a bad receiver on the near-end NE. If intermediate transport equipment is involved, then the analysis and considerations are somewhat more complex.

Task Complete the following steps to clear an LOF alarm.

1 From the WaveStar CIT *System View*, click on the **Alarm List** button.

Important! Observe the column *Alarm Issue Point* and make a note of the AID that corresponds to the entry for the Loss of Frame.

2

If the Alarm List display includes…	Then continue with…
OC192, Loss of Frame	Supporting Element
OC48, Loss of Frame	Supporting Element
OC12, Loss of Frame	Supporting Element **Reference:** "SE 545-3: Clear 'OC12 Loss of Frame'" (-17)
OC3, Loss of Frame	Supporting Element **Reference:** "SE 545-4: Clear 'OC3 Loss of Frame'" (-19)
T3 DS3, Loss of Frame	Supporting Element **Reference:** "SE 545-5: Clear 'T3 DS3 Loss of Frame'" (-21)

ND OF STEPS

Important! Select one of the above tables to document this task.

SE 545-1: Clear ‘OC192 Loss of Frame’

Task

Important! Before beginning this task it is important to know whether an intermediate transport system exists between the transmit NE and its corresponding receive NE. An intermediate transport system will complicate the issue of identifying exactly where the fault exists.

The topology of your ring may look somewhat like that depicted in Figure 545-1, “Near-End and Far-End NEs with Intermediate Transport Equipment” (-2). For analysis purposes, let us assume that you are logged in at NE #2 and that this is where the LOF is being reported in the Alarm List.

Perform the steps below to clear an *OC192 LOF* alarm.

1 Refer to the office records and determine what components make up the transport system. For example, is there intermediate equipment (such as an Optical Line System) between the two NEs?

If...	Then...
YES,	continue with Step 2.
NO,	go to Step 26.

2 Contact or, if possible, log in to the node that is figuratively represented by NE=A. Determine whether that node is detecting/reporting an LOS alarm.

Is the far-end node (which is represented as NE=A) detecting an LOS?

If...	Then...
YES,	the recommendation is to replace the transmitter circuit pack in that span (which in Figure 545-1, “Near-End and Far-End NEs with Intermediate Transport Equipment” (-2) is represented as NE #1). Continue with Step 19. **Reference:** Figure 545-1, “Near-End and Far-End NEs with Intermediate Transport Equipment” (-2)

If...	Then...
NO,	continue.

Important! Step 4 through Step 9 are optional. They require the use of a SONET test set. If you do not have access to a test set, then you can continue with Step 31.

3 When using the test set:

1. Disconnect the receive fiber (from NE#1) at node NE=A, or at a cross-connect bay that is located near that NE.
2. Verify that the fiber connector is clean, and then connect the disconnected fiber to the test set.
3. Check and determine whether or not you are detecting a framed signal at the test set.

Reference: Task 703: Clean Optical Fibers and Connectors

4 Is a framed signal detected by the test set?

If...	Then...
YES,	the problem must be at the near-end node (NE #2). Go to Step 16. **Reference:** Figure 545-1, "Near-End and Far-End NEs with Intermediate Transport Equipment" (-2)
NO,	continue.

Important! The problem is either a contaminated fiber connector at node NE#1 or the transmitter at node NE#1.

5 Contact the on-site craft at node (NE #1) and instruct them to:

1. Disconnect the suspected fiber connection at the transmitter.
2. Clean and reconnect the fiber to the OUT connector.

Reference: Task 703: Clean Optical Fibers and Connectors

6 Is a framed signal detected by the test set?

If...	Then...
YES,	the problem must have been a contaminated connector. Continue with Step 9.
NO,	continue with the next step.

7 Contact the on-site craft at node (NE #1) and instruct them to replace the transmit circuit pack and reconnect the fiber.

8 Is a framed signal detected by the test set?

If...	Then...
YES,	continue.
NO,	escalate to next higher level of technical support.

9 Instruct the on-site craft, at node NE =A to:

1. Disconnect the fiber from the test set.
2. Clean the fiber connector.
3. Reconnect the fiber connector to node NE=A.

Reference: Task 703: Clean Optical Fibers and Connectors

10 At node NE#2 and from the *System View* screen, click on the **Update Alarms** button.

11 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	*STOP! End of Task*.

12 Clean the optical fiber and connector at the test set.

Reference: Task 703: Clean Optical Fibers and Connectors

13 Is a framed signal detected by the test set?

If...	**Then...**
YES,	*STOP! End of Task.*
NO,	continue.

14 Escalate to the next higher level of technical support.

15 Instruct the on-site craft at node NE=A to:

1. disconnect the fiber from their test set
2. Clean that fiber.
3. reconnect to the fiber to receiver of NW=A.

Reference: Task 703: Clean Optical Fibers and Connectors.

16 Instruct the on-site craft, at the near-end node (NE #2), to replace the receiver circuit pack.

Reference: Figure 545-1, “Near-End and Far-End NEs with Intermediate Transport Equipment” (-2)

17 Click on the **Update Alarms** button.

18 Is the same LOF still displayed in the Alarm List?

If...	**Then...**
YES,	escalate to the next higher level of technical support.
NO,	*STOP! End of Task.*

19 Click on the **Update Alarms** button.

20 Is the same LOF still displayed in the Alarm List?

If...	**Then...**
YES,	continue with Step 21.
NO,	*STOP! End of Task*.

21 Instruct the on-site craft to remove the newly installed circuit pack and replace it with the original circuit pack.

Reference: Figure 545-1, "Near-End and Far-End NEs with Intermediate Transport Equipment" (-2)

22 Click on the **Update Alarms** button.

23 Is the same LOF still displayed in the Alarm List?

If…	**Then…**
YES,	escalate to the next higher level of technical support.
NO,	*STOP! End of Task*.

Important! The topology of your ring may look somewhat like that depicted in Figure 545-2, "Near-End and Far-End NEs without Intermediate Transport Equipment" (-2). For analysis purposes, let us assume that you are at NE = 2.

24 Contact the on-site craft at the far-end node (NE = 1) and instruct them to replace the transmitter (circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before re-connection, whether or not the connector is known to be causing a problem.

25 Click on the **Update Alarms** button.

26 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	continue with Step 27.
NO,	*STOP! End of Task*.

27 Instruct the on-site craft at the far-end NE (NE = 1) to replace the newly installed transmitter circuit pack with the original circuit pack.

28 Instruct the on-site craft at the near-end NE (NE = 2) to replace the receiver circuit pack.

29 Click on the **Update Alarms** button.

30 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	*STOP! End of Task*.

31 Contact the on-site craft at the far-end node and instruct them to replace the transmitter (circuit pack). Continue with Step 23.

ND OF STEPS

SE 545-2: Clear ‘OC48 Loss of Frame’

Task

Important! Before beginning this task, it is important to know whether an intermediate transport system exists between the transmit NE and its corresponding receive NE. An intermediate transport system will complicate the issue of identifying exactly where the fault exists.

Perform the steps below to clear an *OC48 LOF* alarm.

1 Refer to the office records and determine what components make up the transport system. For example, is there intermediate equipment (such as an Optical Line System) between the two NEs?

If...	Then...
YES,	continue with Step 2.
NO,	go to Step 27.

Important! The topology of your ring may look somewhat like that depicted in Figure 545-1, “Near-End and Far-End NEs with Intermediate Transport Equipment” (-2). For analysis purposes, let us assume that you are logged in at NE #2 and that this is where the LOF is being reported in the Alarm List.

2 Contact or, if possible, log in to the node that is figuratively represented by NE=A. Determine whether that node is detecting/reporting an LOS alarm.

3 Is the far-end node (which is represented as NE=A) detecting an LOS?

If...	**Then...**
YES,	the recommendation is to replace the transmitter circuit pack in that span (which in Figure 545-1, "Near-End and Far-End NEs with Intermediate Transport Equipment" (-2) is represented as NE #1). Continue with Step 20. **Reference:** Figure 545-1, "Near-End and Far-End NEs with Intermediate Transport Equipment" (-2)
NO,	continue with next step.

Important! Step 4 through Step 15 are optional. They require the use of a SONET test set. If you do not have access to a test set, then you can continue with Step 32.

4 When using the test set:

1. Disconnect the receive fiber at node NE=A, or at a cross-connect bay that is located near that NE
2. Verify that the fiber connector is clean and then connect the disconnected fiber to the test set
3. Check and determine whether or not you are detecting a framed signal at the test set.

5 Is a framed signal detected by the test set?

If...	**Then...**
YES,	the problem must be at the near-end node (NE #2). Go to Step 17. **Reference:** Figure 545-1, "Near-End and Far-End NEs with Intermediate Transport Equipment" (-2)
NO,	continue with next step.

Important! The problem is either a contaminated fiber connector at node NE#1 or the transmitter at node NE#1.

6 Contact the on-site craft at node (NE #1) and instruct them to:

1. Disconnect the suspected fiber connection at the transmitter.
2. Clean and reconnect the fiber to the OUT connector.

Reference: Task 703: Clean Optical Fibers and Connectors

7 Is a framed signal detected by the test set?

If...	Then...
YES,	the problem must have been a contaminated connector. Continue with Step 10.
NO,	continue with next step.

8 Contact the on-site craft at node (NE #1) and instruct them to replace the transmit circuit pack and reconnect the fiber.

9 Is a framed signal detected by the test set?

If...	Then...
YES,	continue.
NO,	escalate to the next higher level of technical support.

10 Instruct the on-site craft at node NE = A to:

1. Disconnect the fiber from the test set.
2. Clean the fiber connector.
3. Reconnect the fiber connector to node NE=A.

Reference: Task 703: Clean Optical Fibers and Connectors

11 At node NE#2 and from the *System View* screen, click on the **Update Alarms** button.

12 Is the same LOF still displayed in the Alarm List?

If…	Then…
YES	escalate to the next higher level of technical support.
NO,	*STOP! End of Task.*

13 Clean the optical fiber and connector at the test set.

Reference: Task 703: Clean Optical Fibers and Connectors

14 Is a framed signal detected by the test set?

If…	Then…
YES	*STOP! End of Task.*
NO,	continue.

15 Escalate to the next higher level of technical support.

16 Instruct the on-site craft at node NE=A to:

1. Disconnect the fiber from their test set.
2. Clean that fiber.
3. Reconnect to the fiber to receiver of NW=A.

17 Instruct the on-site craft at the near-end node (NE #2) to replace the receiver circuit pack.

Reference: Figure 545-1, “Near-End and Far-End NEs with Intermediate Transport Equipment” (-2)

18 Click on the **Update Alarms** button.

19 Is the same LOF still displayed in the Alarm List?

If...	**Then...**
YES,	escalate to the next higher level of technical support.
NO,	*STOP! End of Task*.

20 Click on the **Update Alarms** button.

21 Is the same LOF still displayed in the Alarm List?

If...	**Then...**
YES,	continue with Step 22.
NO,	*STOP! End of Task*.

22 Instruct the on-site craft to remove the newly installed circuit pack and replace it with the original circuit pack.

Important! Each fiber connection/fiber connector should always be cleaned before re-connection, whether or not the connector is known to be causing a problem.

Reference: Figure 545-1, "Near-End and Far-End NEs with Intermediate Transport Equipment" (-2)

Task 703: Clean Optical Fibers and Connectors

23 Click on the **Update Alarms** button.

24 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	*STOP! End of Task*.

Important! The topology of your ring may look somewhat like that depicted in Figure 545-2, "Near-End and Far-End NEs without Intermediate Transport Equipment" (-2) For analysis purposes, let us assume that you are at NE = 2.

25 Contact the on-site craft at the far-end node (NE = 1) and instruct them to replace the transmitter (circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

Reference: Figure 545-2, "Near-End and Far-End NEs without Intermediate Transport Equipment" (-2)

Task 703: Clean Optical Fibers and Connectors

26 Click on the **Update Alarms** button.

27 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	continue with Step 28.
NO,	*STOP! End of Task*.

28 Instruct the on-site craft at the far-end NE (NE = 1) to replace the newly installed transmitter circuit pack with the original circuit pack.

29 Instruct the on-site craft at the near-end NE (NE = 2) to replace the receiver circuit pack.

30 Click on the **Update Alarms** button.

31 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	*STOP! End of Task*.

32 Contact the on-site craft at the far-end node and instruct them to replace the transmitter (circuit pack). Continue with Step 24.

ND OF STEPS

SE 545-3: Clear 'OC12 Loss of Frame'

Task

Important! Regardless of whether or not the OC12 circuit pack is a member of a protection group, the circuit pack replacement considerations are the same.

Perform the steps below to clear an *OC12 LOF* alarm.

Important! The first step is to replace the transmitter at the far-end NE.

1 Instruct the on-site craft at the far-end NE to replace the transmitter (OC12 circuit pack).

Important! Refer to the appropriate vendor-supplied documentation.

2 On the near-end NE, click on the **Update Alarms** button.

3 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	*STOP! End of Task*.

4 Instruct the far-end craft to replace the newly installed OC12 circuit pack with the original circuit pack.

5 Instruct the near-end craft to replace the receiver (OC12 circuit pack).

Reference: Figure 545-2, "Near-End and Far-End NEs without Intermediate Transport Equipment" (-2)

6 On the near-end NE, click on the **Update Alarms** button.

7 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 8.
NO,	*STOP! End of Task*.

8 Escalate to the next higher level of technical support.

ND OF STEPS

SE 545-4: Clear ‘OC3 Loss of Frame’

Perform the steps below to clear an *OC3 LOF* alarm’

Important! Regardless of whether or not the OC3/STM1 circuit pack is a member of a protection group, the circuit pack replacement considerations are the same.

The first step is to replace the transmitter at the far-end NE.

1 Instruct the on-site craft, at the far-end NE, to replace the transmitter (OC3/STM1 circuit pack).

Important! Refer to the appropriate vendor-provided documentation.

2 On the near-end NE, click on the **Update Alarms** button.

3 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	*STOP! End of Task*.

4 Instruct the far-end craft to replace the newly installed OC3/STM1 circuit pack with the original circuit pack.

5 Instruct the near-end craft to replace the receiver (OC3/STM1 circuit pack).

Reference: Figure 545-2, “Near-End and Far-End NEs without Intermediate Transport Equipment” (-2)

6 On the near-end NE, click on the **Update Alarms** button.

7 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 8.
NO,	*STOP! End of Task*.

8 Escalate to the next higher level of technical support.

ND OF STEPS

SE 545-5: Clear ‘T3 DS3 Loss of Frame’

Task Perform the steps below to clear a *T3 DS3 LOF* alarm.

Important! This alarm indicates that the DS3 signal at the INPUT jack has failed.

Regardless of whether or not the DS3 circuit pack is a member of a protection group, the circuit pack replacement considerations are the same.

The first step is to replace the transmitter at the far-end NE.

1 Instruct the on-site craft at the far-end NE to replace the transmitter (DS3 circuit pack).

Important! Refer to the appropriate vendor-supplied documentation.

2 On the near-end NE, click on the **Update Alarms** button.

3 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	*STOP! End of Task*.

4 Instruct the far-end craft to replace the newly installed DS3 circuit pack with the original circuit pack.

5 Instruct the near-end craft to replace the receiver (DS3 circuit pack).

Reference: Figure 545-2, “Near-End and Far-End NEs without Intermediate Transport Equipment” (-2)

6 On the near-end NE, click on the **Update Alarms** button.

7 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 8.
NO,	*STOP! End of Task*.

8 Escalate to the next higher level of technical support.

ND OF STEPS

Task 547: Clear 'DS3EC1/8 Circuit Pack Failure'

Purpose

Use this task to:

- Obtain the identity of an alarmed DS3EC1/8 circuit pack.
- Replace the alarmed circuit pack.
- Verify that the alarm has been cleared.

Required equipment

The following list of equipment is required in order to successfully complete this procedure:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement DS3EC1/8 circuit pack.

Alarm clearing strategy

Use the following alarm-clearing strategy when trying to clear a *DS3EC1/8 Circuit Pack Failure* alarm.

1. Determine whether the alarm is on the protection circuit pack (*eprn*) or on one of the working circuit packs (slots *1 through 6* and slots *11 through 16*).
2. If the alarm is an eprn, the task will instruct you to replace that circuit pack without further considerations.
3. If, simultaneously, an alarm also exists on one or more of the working circuit packs, then after replacing the failed eprn there should be a protection switch to eprn.
4. If the alarm is on only one of the working circuit packs, then you should verify that a protection switch is in effect.
   - If the auto protection switch is in effect, then it is okay to replace the failed circuit pack.
   - If the auto protection switch is not in effect, then the craft should do a manual protection switch.

Before you begin

Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject network element (NE).
2. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the button labeled **Alarm List**.

Task Complete the following steps to clear a *DS3EC1/8 Circuit Pack Failure* alarm

---

1 From the *Alarm List*, determine the AID of the failed circuit pack/packs.

Important! If the DS3EC1/8 circuit pack is part of a 1xN equipment protection group, the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted. However, if the DS3EC1/8 circuit pack is part of a 0x1 nonprotected group, both the ACTIVE LED (green) and FAULT LED (red) will be lighted simultaneously.

---

2 Is the failed circuit pack part of a 1xN protection group?

If…	Then…
YES,	continue with Step 3.
NO,	go to Step 15.

---

3 From the Alarm List, determine whether or not an *eprn Circuit Pack Failure* also exists. Is the AID that of the eprn slot?

If…	Then…
YES,	go to Step 14.
NO,	continue.

---

4 From the *System View*:

1. Click on *View-Protection*.
2. Click on the tab that is labeled *Prot Grp*.
3. In the Windows-like explorer, expand down the directory until *1xN Equipment eds3ec1grp* is displayed; then highlight that protection group.
4. Click on the **Select** button.

Important! A manual switch or a forced switch can be used if replacement of a circuit pack is necessary. These will be required only if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State is *Equipment Fail*) is enough to replace a defective circuit pack.

5 For the *View Protection* screen and for the field that is labeled *Switch Request State:* "Is *Equipment Fail* listed?"

If…	Then…
YES,	a protection switch is in effect. Continue with Step 6.
NO,	you should perform a *Manual Protection Switch*. **Reference:** "SE 547-1: Perform a Manual Protection Switch on the DS3/EC1" (-6)

6 Instruct the on-site craft to go to the identified AID and physically unlatch and remove that circuit pack and insert a known good replacement circuit pack.

Important! The newly installed DS3EC1/8-cp should reinitialize (green LED blinks and clears, and then no red LED) in less than 2 minutes.

7 Wait 2 minutes for this circuit pack to reinitialize.

8 Click on the **Update Alarms** button.

9 Does the list include this same circuit pack failure alarm?

If…	Then…
YES	go to Step 13.
NO,	continue.

10 Does the list include other DS3EC1/8 circuit pack failure alarms?

If…	**Then…**
YES,	go to Step 4.
NO,	continue.

11 Did you perform a *Manual Protection Switch* in Step 4?

If…	**Then…**
YES,	you should perform a Clear Protection Switch. **Reference:** "SE 547-2: Clear Protection Switch" (-7)
NO,	continue.

12 S*TOP! End of Task.*

13 Escalate to the next higher level of technical support.

14 Instruct the on-site craft to go to the AID of the eprn slot and:

1. Physically unlatch and remove that circuit pack.
2. Insert a known good replacement circuit pack.
3. Continue with Step 7.

Important! For the 0x1 DS3EC1/8 applications, the failure will typically be just one port while the remaining seven will be functioning normally. With this scenario, the failed port will result in a loss of service to that single port. However, during the time interval that this circuit pack is removed from the shelf and until its replacement is rebooted, all eight ports will experience a loss of service.

15 The rolling of traffic from 0x1 ports and the subsequent restoration of service are topics deemed outside the scope of this AMTCG. You should refer to your local operating procedures to determine the steps required to roll any unprotected traffic.

16 Instruct the on-site craft to go to the identified AID and:

1. Physically unlatch and remove that circuit pack.
2. Insert a known good replacement circuit pack.
3. Continue with Step 17.

Important! The newly installed DS3EC1/8-cp should reinitialize (green LED blinks and clears, or green LED blinks and remains lighted, and then no red LED) in less than 2 minutes.

17 Wait 2 minutes for this circuit pack to reinitialize.

18 Click on the **Alarm List** button.

19 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 13.
NO,	continue.

20 As appropriate, use your local operating procedures to determine the steps required to roll any unprotected traffic back to the newly replaced DS3EC1/8 circuit pack.

ND OF STEPS

SE 547-1: Perform a Manual Protection Switch on the DS3/EC1

Perform the following steps to manually switch the alarmed DS3EC1/8 circuit pack to the eprn protection circuit pack.

---

1 From the *System View* screen:

1. Click on *Fault-Protection Switc*h.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory until *1xN Equipment ds3ec1grp* is displayed; then highlight that protection group.
4. Click on the **Select** button.

   The right-hand part of the screen will display the selected *Protection Group AID:* (for example, 1-1-#-#-eprn-cp). Also, this display shows a drop-down box for the *Working Pack AIDs:*.
5. Click on the drop-down arrow for the field *Working Pack AIDs*: and highlight the AID of the alarmed circuit pack.
6. In the field labeled *Switch Type:* left-click on the drop-down arrow and highlight Manual.
7. Click on the **Apply** button.
8. Read the information message and, as appropriate, left-click on the **YES** button.

---

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual Protection Switch* command was successful.

> **Important!** Any currently existing higher priority protection switch command would cause the command to fail. If the command was successful, the list will display `Protection Switch` (appropriate AID) `Successful`.

---

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	*STOP! End of Supporting Task*.
NO,	continue.

4 Escalate to the next higher level of technical support.

ND OF STEPS

SE 547-2: Clear Protection Switch

Perform the following steps to *Clear* an existing Manual Protection Switch.

1 From the *System View* screen:

1. Select *Fault-Protection Switch*.
2. In the Windows-like explorer, expand/scroll down the directory until the AID *1xN Equipment eds3ec1grp* is shown. Then highlight that protection group AID.

   The *Clear* command does NOT require the craft to input (select) either Working or Protection AIDs.
3. Click on the **Select** button.
4. On the right-hand side of the screen, left-click on the drop-down arrow beside the field labeled *Switch Type:*.
5. Click on *Clear*.
6. Click on the **Apply** button
7. Read the information in the Caution box, and left-click on the **YES** button.
8. Click on the **Close** button.

ND OF STEPS

Task 548: Clear ‘OC48/STM16 Circuit Pack Failure’

Purpose

Use this task to:

- Obtain the identity of an alarmed OC48/STM16 circuit pack
- Replace the alarmed circuit pack
- Verify that the alarm has been cleared.

Required equipment

The following items are required before beginning this procedure:

- WaveStar® Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement OC48 circuit pack.

Important considerations

1. An OC48/STM16 circuit pack can only be used in a 0x1 (nonprotected) equipment configuration. However, the nonprotected circuit pack may be used to support facilities that are:
   - 1+1 protected, or
   - BLSR protected,
   - 0x1 nonprotected.
2. Regarding revertive and nonrevertive switching:
   - For 1+1 facilities, upon failure of the working circuit pack service will be automatically switched to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive*.
   - For 1+1 facilities the defaults are:

     — Nonrevertive (but can be provisioned as revertive)

     — At initial start-up of an NE, service is provided by the *working line*

     — At initial provisioning, service is provided by the *working line*.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject network element (NE).
2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the **Alarm List** button.

Task Perform the following steps to clear an *OC48/STM16, Circuit Pack Failure* alarm.

1 From the Alarm List, determine the AID of the failed circuit pack.

Important! The OC48/STM16 circuit pack may be: (a) part of a BLSR facilities protection group (b) part of a 1+1 facilities protection group, or (c) part of a 0x1 nonprotected group. Regardless of the type of facilities protection, the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted.

2 Is the failed circuit pack part of a BLSR or 1+1 facilities protection group?

If…	Then…
YES,	continue with Step 3.
NO,	go to Step 12.

3 From the *System View* screen:

1. Click on **View-Protection**.
2. *C*lick on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen, expand down the directory until the desired protection group (for example, *_F BLSR…* or *1+1 Optical ...*) is displayed. Then highlight the protection group.

4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State: equals *Signal Failure*) is enough to replace a defective circuit pack.

4 For the *View Protection* screen and for the field that is labeled *Switch Request State:* "Is *Signal Failure* listed?"

If…	**Then…**
YES,	a protection switch is in effect. Continue with Step 5.
NO,	you should perform a *Manual Protection Switch*. **Reference:** "SE 548-1: Perform a Manual Protection Switch" (-6)

Important! The OC48/STM16 is a single port type circuit pack. Therefore, for the application where it is supporting a BLSR/MS-SPring facility protection group or a 1+1 facility protection group, all traffic will be automatically switched to the other circuit pack upon declaring an OC48/STM16 circuit pack failure.

5 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack.
2. Physically unlatch and remove the alarmed circuit pack.
3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the two fibers (OUT to OUT) and (IN to IN).

Reference: Task 700: How to properly remove a circuit pack

Reference: Task 703: Clean Optical Fibers and Connectors

Important! The newly installed OC48/STM16 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes—depending on other ongoing system activities.

6 Wait for this circuit pack to reinitialize.

7 Click on the **Alarm List** button.

8 Does the list include this same circuit pack failure alarm?

If…	**Then…**
YES,	go to Step 11.
NO,	continue.

9 Did you perform a *Manual Protection Switch* in Step 3?

If…	**Then…**
YES,	you should perform a *Clear Protection Switch*. **Reference:** “SE 548-2: Clear Protection Switch” (-8)
NO,	continue.

10 *STOP! End of Task*.

11 Escalate to the next higher level of technical support.

Important! For the 0x1 OC48/STM16 applications, a circuit pack failure means a complete loss of service on this particular facility.

12 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack (the AID from Step 1).
2. Physically unlatch and remove the failed circuit pack.
3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the two fibers (OUT to OUT) and (IN to IN).

Reference: Task 700: How to properly remove a circuit pack

Reference: Task 548: Clear 'OC48/STM16 Circuit Pack Failure'

Important! The newly installed OC48/STM16 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes, depending on other ongoing system activities.

13 Wait for this circuit pack to reinitialize.

14 Click on the **Alarm List** button.

15 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11.
NO,	go to Step 10.

ND OF STEPS

SE 548-1: Perform a Manual Protection Switch

Task Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

1 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *2F BLSR ...*) is displayed. Then, highlight the appropriate protection group.
4. Click on the **Select** button.
5. If … *East Port AID*… is alarmed, then***:***
   e. for the field that is labeled *Direction:* select

      West

      for the field that is labeled *Switch Type:* select

      Manual to Protection, Ring
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side* _ command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display `Protection Switch (appropriate AID) Successful`.

3 Was the *Manual Protection Switch* command successful?

If…	Then…
YES,	*Stop! End of Supporting Task.*
NO,	continue.

4 Escalate to the next higher level of technical support.

ND OF STEPS

SE 548-2: Clear Protection Switch

Task Perform the following steps to *Clear* an existing manual protection switch.

1 From the *System View* screen:

1. Select **Fault-Protection Switch**.
2. In the Windows-like explorer, expand down the directory until the desired AID is shown.
3. Click to highlight the desired AID.
4. Click on the **Select** button.
5. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type:*.
6. Click on **Clear**.
7. Click on the **Apply** button.
8. Read the information in the *Caution* box and then click on the **YES** button.
9. Click on the **Close** button.

ND OF STEPS

Task 549: Clear 'OC12/STM4 Circuit Pack Failure'

Purpose

Use this task whenever the NE Alarm List displays an *OC12/STM4 Circuit Pack Failure*.

Required equipment

The following items are the minimum equipment requirements for completing this task:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement OC12/STM4 circuit pack.

Important considerations

1. An OC12/STM4 circuit pack can be used only in a 0x1 (nonprotected) equipment configuration. However, the nonprotected circuit pack may be used to support facilities that are:
   a. 1+1 protected, or
   b. 0x1 nonprotected.
2. Regarding revertive and nonrevertive switching:
   a. For 1+1 facilities, upon failure of the working circuit pack, service will be switched automatically to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive*.
   b. For 1+1 facilities, the defaults are:
   – Nonrevertive (but can be provisioned as revertive).
   – At initial startup of an NE, service is provided by the *working line.*
   – At initial provisioning, service is provided by the *working line*.

   Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.
2. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task Perform the following steps to clear an *OC12/STM4 Circuit Pack Failure* alarm.

---

1 From the Alarm List, determine the AID of the failed circuit pack.

Important! The OC12/STM4 is a 2-port type of circuit pack. If both ports provide service to 1+1 facility protection groups, then the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted. However, if at least one of the two ports is part of a 0x1 nonprotected group, then both the ACTIVE LED (green) and FAULT LED (red) will be lighted simultaneously.

---

2 Does the failed circuit pack provide service to a 1+1 facilities protection group?

If…	Then…
YES,	continue with Step 3.
NO,	go to Step 12.

Important! If the circuit pack is being used to provide service to a 1+1 facility protection group, then at least one port (and perhaps two) will be protected automatically upon circuit pack failure.

3 From the *System View* screen:

1. Click on **View-Protection**.
2. Click on the tab labeled **Prot Grp**.

3. In the Windows-like explorer screen, expand/scroll down the directory until the desired protection group (for example, *1+1 Optical* ...) is displayed. Then highlight the protection group.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will be required only if something abnormal occurred. Under normal operations, an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State: equals *Signal Failure*) is enough to replace a defective circuit pack.

4 For the *View Protection* screen and for the field that is labeled *Switch Request State:* "Is *Signal Failure* listed?"

If…	Then…
YES,	a protection switch is in effect. Continue with Step 6.
NO,	you should perform a *Manual Protection Switch*. **Reference:** "SE 549-1: Perform a Manual Protection Switch" (-6)

5 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack.
2. Physically unlatch and remove the alarmed circuit pack.
3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the fibers.

Reference: "Task 549: Clear 'OC12/STM4 Circuit Pack Failure'" (-1)

Reference: Task 703: Clean Optical Fibers and Connectors

Important! The newly installed OC12/STM4 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes – depending on other ongoing system activities.

6 Wait for this circuit pack to reinitialize.

7 Click on the **Update Alarms** button.

8 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11.
NO,	continue.

9

If, in Step 3, you…	Then…
performed a *Manual Protection Switch*,	you may, as an option, chose to return service to the original side with a *Clear Protection Switch* command. **Reference:** "SE 549-2: Clear Protection Switch" (-8)
did not perform a *Manual Protection Switch*,	continue with Step 10.

10 *STOP! End of Task*.

11 Escalate to the next higher level of technical support.

Important! At this point you should have determined which port or ports are listed as unprotected. Depending on what part of the circuit pack failed, either one or both ports could still be providing service. In order to not interrupt this service, it will be necessary to roll it off to other facilities before removing this circuit pack.

12 The rolling of traffic from 0x1 ports and the subsequent restoration of service are topics deemed outside the scope of this user/service manual. You should refer to your local operating procedures to determine the steps required to roll any unprotected traffic.

13 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack.
2. Physically unlatch and remove the alarmed circuit pack.
3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the fibers.

Reference: Task 700: How to properly remove a circuit pack

Reference: Task 703: Clean Optical Fibers and Connectors

Important! The newly installed OC12/STM4 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes – depending on other ongoing system activities.

14 Wait for this circuit pack to reinitialize.

15 Click on the **Update Alarms** button.

16 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11.
NO,	continue.

17 If you chose to roll the 0x1 service in Step 12, then you can now restore the service to the newly installed circuit pack.

ND OF STEPS

SE 549-1: Perform a Manual Protection Switch

Task Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

1 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen, expand/scroll down the directory until the desired protection group (for example, *....1+1 Optical o...*) is displayed. Then, highlight the appropriate protection group.
4. Click on the **Select** button.
5. In the field labeled *Switch Type:*, click on the drop-down arrow and:
   a. if *....Wkg...* is alarmed, then select **Manual to Protection**, or
   b. if *....Ptn...* is alarmed, then select **Manual to Working**.
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to* ______ command was successful.

> **Important!** Any currently existing higher priority protection switch command, or an existing hardware failure on the *manual to* ______, would cause the command to fail. If the command was successful, then the list will display `Protection Switch` (appropriate AID) `Successful`.

3 Was the *Manual Protection Switch* command successful?

If…	**Then…**
YES,	*STOP! End of Supporting Task.*
NO,	continue.

4 Escalate to the next higher level of technical support.

ND OF STEPS

SE 549-2: Clear Protection Switch

Task Perform the following steps to *Clear* an existing manual protection switch.

1 From the *System View* screen:

1. Select **Fault-Protection Switch**.
2. In the Windows-like explorer, expand/scroll down the directory until the desired AID is shown.
3. Click to highlight the desired AID.
4. Click on the **Select** button.
5. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type:*.
6. Click on *Clear*.
7. Click on the **Apply** button.
8. Read the information in the *Caution* box, and then click on the **YES** button.
9. Click on the **Close** button.

N D O F S T E P S

Task 550: Clear ‘OC3/STM1 Circuit Pack Failure’

Purpose

Use this task whenever the NE Alarm List displays an *OC3/STM1 Circuit Pack Failure*.

Required equipment

The following items are the minimum equipment requirements for completing this task:

- WaveStar® Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement OC3/STM1 circuit pack

Important considerations

1. An OC3/STM1 circuit pack can be used only in a 0x1 (nonprotected) equipment configuration. However, the nonprotected circuit pack may be used to support facilities that are:
   a. 1+1 protected, or
   b. 0x1 nonprotected.
2. Regarding revertive and nonrevertive switching:
   a. For 1+1 facilities, upon failure of the working circuit pack, service will be switched automatically to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive*.
   b. For 1+1 facilities, the defaults are:
   – Nonrevertive (but can be provisioned as revertive).
   – At initial startup of an NE, service is provided by the *working line.*
   – At initial provisioning, service is provided by the *working line*.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.
2. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.
3. From the System View screen of the subject NE, click on the button that is labeled **Alarm List**.

Task Perform the following steps to clear an *OC3/STM1 Circuit Pack Failure* alarm.

---

1 From the *Alarm List*, determine the AID of the failed circuit pack.

> **Important!** The OC3/STM1 is a 4-port type of circuit pack. If all four ports provide service to 1+1 facility protection groups, then the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted. However, if at least one of the four ports is part of a 0x1 nonprotected group, then both the ACTIVE LED (green) and FAULT LED (red) will be lighted simultaneously.

---

2 Does the failed circuit pack provide service to a 1+1 facilities protection group?

If…	Then…
YES,	continue with Step 3.
NO,	go to Step 12.

> **Important!** If the circuit pack is being used to provide service to a 1+1 facility protection group, then at least one port (and perhaps all four) will be protected automatically upon circuit pack failure.

3 From the *System View* screen:

1. Click on **View-Protection**.
2. Click on the tab labeled **Prot Grp**.

3. In the Windows-like explorer screen, expand/scroll down the directory on Bay __ and I/O Shelf __ until the desired protection group (for example, *1+1 Optical o...*) is displayed. Then highlight the protection group.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will be required only if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State:* equals *Signal Failure*) is enough to replace a defective circuit pack.

4 For the *View Protection* screen and for the field that is labeled *Switch Request State:* "Is *Signal Failure* listed?"

If…	**Then…**
YES,	a protection switch is in effect. Continue with Step 6.
NO,	you should perform a *Manual Protection Switch* **Reference:** "" (-6)

5 Instruct the on-site craft to:

1. Physically open the upper latch.
2. Wait 5 seconds.
3. Physically open the lower latch. While using both upper and lower latches, pull this circuit pack from the shelf.
4. Insert a known good replacement circuit pack.

Important! The newly installed OC3/STM1 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in less than 2 minutes.

6 Wait for this circuit pack to reinitialize.

7 Click on the **Update Alarms** button.

8 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11.
NO,	continue.

9 Did you perform a *Manual Protection Switch* in Step 3?

If…	Then…
YES,	you should perform a a *Clear Protection Switch*. **Reference:** "SE 550-2: Clear Protection Switch" (-8)
NO,	continue.

10 *STOP! End of Task.*

11 Escalate to the next higher level of technical support.

Important! At this point you should have determined which port or ports are listed as unprotected. Depending on what part of the circuit pack failed, either one, two, three, or four ports could still be providing service. In order to not interrupt this service, it will be necessary to roll it off to other facilities before removing this circuit pack.

12 The rolling of traffic from 0x1 ports and the subsequent restoration of service are topics deemed outside the scope of this user/service manual. You should refer to your local operating procedures to determine the steps required to roll any unprotected traffic.

13 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Important! The newly installed OC3/STM1 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in less than 2 minutes.

14 Wait for this circuit pack to reinitialize.

15 Click on the **Update Alarms** button.

16 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11.
NO,	continue.

17 If you chose to roll the 0x1 service in Step 12, then you can now restore the service to the newly installed circuit pack.

ND OF STEPS

SE 550-1: Perform a Manual Protection Switch

Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

1 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen, expand/scroll down the directory until the desired protection group (for example, *....1+1 Optical o...*) is displayed. Then, highlight the appropriate protection group.
4. Click on the **Select** button.
5. In the field labeled *Switch Type:*, click on the drop-down arrow and:
   a. if *....Wkg...* is alarmed, then select **Manual to Protection**, or
   b. if *....Ptn...* is alarmed, then select **Manual to Working**.
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the **Manual to ______** command was successful.

> **Important!** Any currently existing higher priority protection switch command, or an existing hardware failure on the *manual to ______*, would cause the command to fail. If the command was successful, then the list will display `Protection Switch` (appropriate AID) `Successful`.

3 Was the *Manual Protection Switch* command successful?

If…	**Then…**
YES,	*STOP! End of Supporting Task.*
NO,	continue.

4 Escalate to the next higher level of technical support.

ND OF STEPS

SE 550-2: Clear Protection Switch

Task Perform the following steps to *Clear* an existing manual protection switch.

1 From the *System View* screen:

1. Select **Fault-Protection Switch**.
2. In the Windows-like explorer, expand/scroll down the directory until the desired AID is shown.
3. Click to highlight the desired AID.
4. Click on the **Select** button.
5. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type:*.
6. Click on **Clear**.
7. Click on the **Apply** button.
8. Read the information in the *Caution* box, and then click on the **YES** button.
9. Click on the **Close** button.

ND OF STEPS

Task 552: Clear 'SYS50DM Circuit Pack Failure'

Purpose

Use this procedure to clear a:

- *SYS50DM Circuit Pack Failure* alarm, or
- PCMCIA NVM failure.

Required equipment

The following items are required before beginning this procedure:

- WaveStar® Craft Interface Terminal (CIT)
- Wrist strap.

Optional equipment

Depending on the specifics of this alarm the on-site craft will need either:

- Spare/replacement SYS50DM circuit pack, or
- The node's most recent backup NVM, or
- A new NVM card.

Safety precautions

To assure both personal safety and the proper functioning of the WaveStar TDM 2.5G (OC-48)/10G (OC-192) system, it is imperative to review and understand this precaution prior to performing this task

CAUTION

Care should be exercised to ensure that ONLY the backup NVM card—that is correct for this NE—is inserted into the SYS50DM.

Task

Important! Anytime that the SYS50DM circuit pack has an alarm, the network element (NE) will be in Maintenance Condition. This alarm and the subsequent Maintenance Condition are referred to as being Non-Service Affecting. This means that all existing circuit-switched paths through the switch fabric are not impacted by the SYS50DM circuit pack alarm or NE being placed in Maintenance Condition. However, no new circuit paths can be constructed and none of the existing can be taken down or rearranged.

In R4.0 and later releases, Maintenance Condition is indicated at the bottom of the System View screen by a red box that displays the word Maintenance.

An alarmed SYS50DM circuit pack may result in an inability to communicate (or establish a log-in session) with that NE. Whenever this is the case the alternative is to instruct the on-site craft to visually determine the status of the NE/SYS50DM. A continuous red LED, on the SYS50DM, should result in (1) that circuit pack being replaced, or (2) that circuit pack's NVM being replaced.

1 Were you successful in establishing a log-in session with the subject NE?

If…	Then…
YES,	go to Step 3.
NO,	continue.

2 Instruct the on-site craft to go to the subject NE and visually determine the status of the SYS50DM circuit pack. Does the SYS50DM have a lighted red LED?

If…	Then…
YES,	go to Step 4.
NO,	go to Step 10.

3 From the Alarm List, determine:

1. The AID of the failed circuit pack
2. Whether the column labeled Description lists:
   - PCMCIA NVM failure, or
   - SYS50DM circuit pack.

4 Does the *Alarm List Description* column indicate *PCMCIA NVM failure*?

If…	Then…
YES,	continue with Step 5. *Steps 5 through 12: Remove defective NVM card, replace/insert this NE's backup NVM card, or if backup NVM card is not available, install new NVM card with the appropriate generic software from either the WaveStar CIT or SNMS.*
NO,	go to Step 21.

5 Instruct the on-site craft to go to the identified AID/SYS50DM and try to remove the NVM card by pressing on the circuit pack **Eject** button.

Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

6 Was the on-site craft successful in ejecting the NVM?

If…	Then…
YES,	continue with Step 7.
NO,	go to Step 22

7 Instruct the on-site craft to:

1. Use a felt-tip pen to mark the defective NVM card as BAD
2. Discard the defective NVM card so as to take it out of circulation.

8 Instruct the on-site craft to obtain the backup NVM for this subject NE.

9 Is a backup NVM available?

If…	Then…
YES,	continue with Step 10.
NO,	go to Step 13.

10 Instruct the on-site craft to:

1. Double check (visually) to ensure that the *in-hand* NVM is correct for the subject NE
2. Carefully, and properly, insert this backup NVM card into the SYS50DM circuit pack.

Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

11 From the WaveStar CIT System View screen select:

1. `Fault-Enter/Exit Maintenance Condition-Exit Maintenance Condition`
2. Read the information message and, as appropriate, click on the **YES** button.

Important! The SYS50DM should *i*nitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

12

1. Wait 2 minutes for this circuit pack to initialize.
2. Log in to this same NE.
3. Continue with Step 34.

Important! The vendor recommends that a backup NVM be maintained, on-site, for each NE residing at that site. Whether this recommendation is actually followed is more or less determined by local operating procedures. Whenever the backup NVM is not available it will be necessary to install the NE's generic software from the WaveStar CIT.

13 *Backup NVM is not available.* Instruct the on-site craft to insert the new NVM into the WaveStar CIT PCMCIA slot and do an *Install New Generic Software* per details specified in the SRD.

14 Instruct the on-site craft to carefully remove the new NVM from the WaveStar CIT.

15 Instruct the on-site craft to insert the new NVM into the NE's SYS50DM circuit pack.

Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

16 From the WaveStar CIT *System View* screen select:

1. Fault-Enter/Exit Maintenance Condition-Exit Maintenance Condition
2. Read the information message and, as appropriate, click on the *YES* button.

Important! At this point the new generic will still contain the Lucent default TID, which is *LUCENT-WAVESTAR-NE*. Also, the NE will be in Maintenance Condition.

17 Change the default TID to the correct value for this NE. As required, refer to office records.

Reference: Task 329

Important! The NE should reboot and automatically enter Maintenance Condition because it does not have a copy of the database.

18 Instruct the on-site craft to manually restore the most recent backup of the NE's database from the WaveStar CIT.

Reference: Task 206

19 From the WaveStar CIT *System View* screen select:

1. Fault-Enter/Exit Maintenance Condition-Exit Maintenance Condition
2. Read the information message and, as appropriate, click on the *YES* button.

Important! The SYS50DM should initialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

20

1. Wait 2 minutes for this circuit pack to *i*nitialize.
2. Log in to this same NE.
3. Continue with Step 34.

21 Instruct the on-site craft to go to the identified AID/SYS50DM and try to remove the NVM card by pressing on the circuit pack Eject button.

Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

Important! If this effort was successful, then exercise care to properly maintain the NVM card for use in the replacement circuit pack. Regardless of whether the on-site craft was successful in removing the NVM card - continue.

22 Instruct the on-site craft to:

1. Physically unlatch and remove the SYS50DM circuit pack.
2. Remove the NVM card from the circuit pack.

Reference: Task 544: How to Eject an NVM Card from an Out-of-Service Circuit Pack

23 Instruct the on-site craft to:

1. Use a felt-tip pen to mark the defective NVM card as BAD.
2. Discard the defective NVM card so as to take it out of circulation.

24 Instruct the on-site craft to obtain the backup NVM for this subject NE.

25 Is a backup NVM available?

If…	**Then…**
YES,	continue with Step 10.
NO,	go to Step 13.

26 Instruct the on-site craft to:

1. Double check (visually) to ensure that the *in-hand* NVM is correct for the subject NE
2. Carefully, and properly, insert this backup NVM card into the SYS50DM circuit pack.

Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

27 Insert the SYS50DM circuit pack (with NVM card pre-inserted per Step 26 (2) into the shelf.

Important! The SYS50DM should *i*nitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

28

1. Wait 2 minutes for this circuit pack to *i*nitialize.
2. Log in to this same NE.
3. Continue with Step 29.

29 Click on the **Update Alarms** button.

30 Does the list include this same *PCMCIA NVM failure* alarm?

If…	Then…
YES,	escalate to the next higher level of technical support.
NO,	continue with Step 16.

31 Instruct the on-site craft to:

1. Physically unlatch and remove the SYS50DM circuit pack
2. Remove the NVM card from the circuit pack, conditional that Step 4 was unsuccessful.

Reference: Task 544: How to Eject an NVM Card from an Out-of-Service Circuit Pack

32 Instruct the on-site craft to:

1. Obtain a known good replacement circuit pack
2. Carefully, and properly, insert the NVM card (which was previously removed in either Step 4 or Step 5) into the replacement SYS50DM circuit pack.
3. Insert the SYS50DM replacement circuit pack (with NVM card pre-inserted per Step 32(2) into the shelf.

Important! The newly installed SYS50DM should *i*nitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

33 Wait 2 minutes for this circuit pack to *i*nitialize.

34 Click on the **Update Alarms** button.

35 Does the list include this same SYS50DM circuit pack failure alarm?

If…	Then…
YES,	escalate to the next higher level of technical support.
NO,	continue

ND OF STEPS

Task 559: Clear ‘SWITCH/576 Circuit Pack Failure’

Purpose Use this task to clear a *SWITCH/STS576 Circuit Pack Failure* alarm.

Required equipment The following equipment is required in order to successfully complete this procedure:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement SWITCH/576 circuit pack.

About side 0 and side 1 The SWITCH/STS576 circuit packs always operate in a 1+1 equipment protection group. This protection group is referred to as the *1+1 Equipment eswitchgrp*. Each eswitchgrp consists of two sides. They are referred to as Side 0 and Side 1. While one side is *Active*, the other side is *Standby*. If, for example, Side 0 is the Active side and any one of its circuit packs fails, then there will be a switch to the Standby side (Side 1). Side 1 now becomes the Active side. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new Standby side. No switch back is required.

Task Complete the following steps to clear a *SWITCH/STS576 Circuit Pack Failure* alarm.

---

1 From the Alarm List**,** determine the AID of the failed SWITCH576 circuit pack.

---

2 From the *System View* screen:

1. Click on **View Protection**.
2. Click on the tab labeled **Ptn Grp**.
3. In the Windows-like explorer screen, expand/scroll down the directory until *1+1 Equipment esysswitchgrp* is displayed and highlighted.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with

proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State:* equals *Equipment Fail*) is enough to replace a defective circuit pack.

3 For the *View Protection* screen and for the field that is labeled **Switch Request State:** "Is *Equipment Fail* listed?"

If...	Then...
YES,	a protection switch is in effect. Continue with Step 4.
NO,	you should perform a *Manual Protection Switch*. **Reference:** SE-559-1

4 Instruct the on-site craft to:

- Physically unlatch and remove the alarmed circuit pack.
- Insert a known good replacement circuit pack.

5 Wait 2 minutes for this circuit pack to reinitialize.

6 From the *System View*, click on the **Update Alarms** button.

7 Does the list include the same STS576 circuit pack failure alarm?

If...	Then...
YES,	go to Step 10.
NO,	continue.

8 Do you have local operating procedures that stipulate something like "Normal operations, for 1+1 Equipment protection groups, should be maintained on Side 0?"

If...	**Then...**
YES,	perform a *Manual to Side 0* protection switch.
NO,	continue. **Important!** Although there is no requirement, some customers may prefer to keep service on Side 0 (Side 0 as Active) and Side 1 available for protection **Reference:** SE 559-2

9 *STOP! End of Task*.

10 Escalate to the next higher level of technical support.

ND OF STEPS

SE 559-1: Perform a Manual Protection Switch to Side _

Task Perform the following steps to manually switch the switch fabric from the current active side to the current standby side.

1 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen expand/scroll down the directory until *1+1 Equipment esysswitchgrp* is displayed and highlighted.
4. Click on the **Select** button.
5. In the field labeled *Switch Type:*, click on the drop-down arrow and:
   - if *....switch0-cp* is alarmed, then select **Manual to Side 1**, or
   - if *....switch1-cp* is alarmed, then select **Manual to Side 0**.
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

   Important! The left-hand part of the screen will display the selected Protection Group AID: (for example, **_-_ esysswitchgrp**). Also, this display shows *....switch0-cp* and *....switch1-cp* AIDs, as well as their individual alarm status.

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-switch side, would cause the command to fail. If the command was successful, then the list will display `Protection Switch` (appropriate AID) `Successful`.

3 Was the *Manual Protection Switch* command successful?

If...	Then...
YES,	*STOP! End of Supporting Task.*
NO,	continue.

4 Escalate to the next higher level of technical support.

N D O F S T E P S

SE 559-2: Perform a Manual Protection Switch to Side 0

Task Perform the following steps to manually switch the I/O fabric from Side 1 to Side 0.

1 From the *System View* screen:

1. Click on the **Fault-Protection Switch**.
2. Click on the tab labeled **Ptn Grp**.
3. In the Windows-like explorer screen, expand/scroll down the directory until *1+1 Equipment esysswitchgrp* is displayed and highlighted.
4. Click on the **Select** button.

   NOTE: The left-hand part of the screen will display the selected *Protection Group AID*. Also, this display shows their individual alarm status.
5. In the field labeled *Switch Type:*, click on the drop-down arrow, and select **Manual to Side 0**.
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

   Important!

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side 0* command was successful.

3 Was the *Manual Protection Switch* command successful?

If...	Then...
YES,	*STOP! End of Supporting Task.*
NO,	continue. **Important!** Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-switch side, would cause the command to fail. If the command was successful, then the list will display something like `Protection Switch (appropriate AID) successful`.

4 Escalate to the next higher level of technical support.

ND OF STEPS

☐

Task 560: Clear ‘TMG/STRAT3 Circuit Pack Failure’

Purpose

Use this procedure to clear a *TMG/STRAT3 Circuit Pack Failure* alarm.

Required equipment

Use the following equipment to complete this task:

- WaveStar® Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement TMG/STRAT3 circuit pack

About Side 0 and Side 1

The two timing circuit packs are referred to as Side 0 and Side 1. While one side is *Active* the other side is either in *Standby* or *Equipment Fail*. There are three types of switching. These are referred to as (a) sync hardware, (b) sync reference, and (c) sync mode. Sync hardware protection switching (from the Active to the Standby) takes precedence over mode switching. Mode switching (from Locked to Holdover) would only come into play whenever a sync hardware protection switch would not be possible because of an *Equipment Fail* state on the alternate circuit pack. No switch back is required.

Task

Complete the following steps to clear a *TMG/STRAT3 Circuit Pack Failure* alarm.

1 From the Alarm List, determine the AID of the failed circuit pack.

2 From the *System View* screen:

1. Click on **View-Protection.**
2. Click on the tab labeled **Prot Grp.**
3. In the Windows-like explorer screen, expand/scroll down the directory until *1+1 Equipment etmggrp* is displayed and highlighted.
4. Click on the **Select** button.
5. In the right-hand part of the screen and under the heading Switch Status, observe which side is the *Active Side:*. If the indicated Active Side is the same as the Alarm Side (for example, *Active Side: 1* and *Side 1 Alarm Status: Critical*), then a manual switch to the other side may be required. This will only be required if

something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State:* equals *Equipment Fail*) is enough to replace a defective circuit pack.

3 Is the Active side different from the side that is alarmed?

If...	Then...
YES,	a protection switch is in effect. Continue with Step 4.
NO, (Active side and Alarms side are the same)	you should perform a *Manual Protection Switch*. **Reference:** "SE 560-1: Perform a Manual Protection Switch of Side _ tmg_ (TMG/ STRAT3)" (-4)

4 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack
2. Insert a known good replacement circuit pack.

Important! The newly installed *tmg( )-cp* should reinitialize (green LED blinks, no red LED, and other circuitry components reinitialize) in approximately 2 minutes. Following a successful reinitialization, the manual switch should remain for another 7 minutes to allow the *tmg()-cp* to fully stabilize. After 7 minutes the manual switch can be cleared.

5 Once installed, wait 7 minutes for this circuit pack to completely stabilize.

6 Click on the **Update Alarms** button.

7 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 8.
NO,	*STOP! End of Task.*

8 Escalate to the next higher level of technical support.

ND OF STEPS

SE 560-1: Perform a Manual Protection Switch of Side _ tmg_ (TMG/STRAT3)

Task Perform the following steps to manually switch the timing circuit pack from the current active side to the current standby side.

1 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen expand/scroll down the directory until *1+1 Equipment etmggrp* is displayed and highlighted.
4. Click on the **Select** button.

   The right-hand part of the screen will display the selected Protection Group AID: (for example, **1-1 etmggrp**). Also, this display shows ....*tmg0-cp* and ....*tmg1-cp* AIDs, as well as their individual alarm status.
5. In the field labeled *Switch Type:* click on the drop-down arrow and
   - if ....*tmg0-cp* is alarmed, then select **Manual to Side 1**, or
   - if ....*tmg1-cp* is alarmed, then select **Manual to Side 0**.
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

   Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like `Protection Switch (appropriate AID) successful`.

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful. Was the *Manual Protection Switch* command successful?

If...	Then...
YES	*STOP! End of Supporting Task.*
NO,	continue.

3 Escalate to the next higher level of technical support.

ND OF STEPS

Task 561: Clear 'ADJCTL/DCCEI Circuit Pack Failure'

Purpose

Use this procedure to clear an *ADJCTL/DCCEI Circuit Pack Failure* alarm.

Required privilege code(s)

The user must have a privilege code of M1 (or higher) to perform this task.

Required equipment

Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement ADJCTL/DCCEI circuit pack.

Task

Complete the following steps to clear an *ADJCTL/DCCEI Circuit Pack Failure* alarm.

1 From the Alarm List, determine the AID of the failed ADJCTL/DCCEI circuit pack.

2 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Reference: Task 700: How to properly remove a circuit pack

Important! The newly inserted circuit pack should reinitialize within approximately 2 minutes – depending on other ongoing system activities

3 Click on the **Update Alarms** button.

4 Does the list include the ADJCTL/DCCEI circuit pack failure?.

If…	Then…
YES,	go to Step 6.
NO,	continue.

5 *STOP! End of Task.*

6 Escalate to your next higher level of technical support.

N D O F S T E P S

Task 562: Clear ‘SWITCH/DS3EC1 Circuit Pack Failure’

Purpose

Use this task whenever the NE Alarm List displays a *SWITCH/ DS3EC1 Circuit Pack Failure*.

Required privilege code(s)

The user must have a privilege code of M1 (or higher) to perform this task.

Required equipment

The following list of equipment is required in order to successfully complete this procedure:

- WaveStar® Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement SWITCH/DS3EC1 circuit pack.

Task

Complete the following steps to clear a *SWITCH/DS3EC1 Circuit Pack Failure* alarm.

1 From the Alarm List, determine whether or not a *DS3EC1, Circuit Pack Failure* also exists. Does the Alarm List also include an entry for a *DS3EC1, Circuit Pack Failure*?

If…	Then…
YES,	go to Step 2.
NO,	go to Step 5.

2

If the Alarm List also includes a…	Then replace the…
DS3EC1 Circuit Pack Failure	DS3EC1 Circuit pack **Reference:** Task 547

3 Click on the **Update Alarms** button.

4 Does the list still include a SWITCH/DS3EC1 circuit pack failure?

If…	Then…
YES,	go to Step 9.
NO,	*STOP! End of Task*.

5 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Important! The newly installed SWITCH/DS3EC1 should reinitialize (green LED blinks, no red LED) in approximately 2 minutes.

6 Wait 2 minutes for this circuit pack to reinitialize.

7 Click on the **Update Alarms** button.

8 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 9.
NO,	*STOP! End of Task*.

9 Escalate to the next higher level of technical support.

ND OF STEPS

Task 563: Clear ‘SWITCH/STS768 Circuit Pack Failure’

Purpose

Use this procedure to clear a *SWITCH/STS768 Circuit Pack Failure* alarm.

About side 0 and side 1

The SWITCH/STS768 circuit packs always operate in a 1+1 equipment protection group. This protection group is referred to as the *1+1 Equipment eswitchgrp*. Each *esysswitchgrp* consists of two sides. They are referred to as Side 0 and Side 1. While one side is *Active* the other side is *Standby*. If, for example, Side 0 is the Active side and any one of its circuit packs fails - then there will be a switch to the Standby side (Side 1). Side 1 now becomes the Active side. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new Standby side. No switch back is required.

Required equipment

Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement SWITCH/768 circuit pack.

Task

Complete the following steps to clear a SWITCH/*STS768 Circuit Pack Failure* alarm.

---

1 From the Alarm List, determine the AID of the failed circuit pack.

---

2 From the *System View* screen:

1. Click on **View-Protection**.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory until *1+1 Equipment esysswitchgrp* is displayed.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with

proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State:* equals *Equipment Fail*) is enough to replace a defective circuit pack.

3 For the *View Protection* screen and for the field that is labeled **Switch Request State:** "Is *Equipment Fail* listed?"

If ...	Then ...
YES,	a protection switch is in effect. Continue with Step 4.
NO,	you should perform a *Manual Protection Switch*. **Reference:** "SE 563-1: Perform a Manual Protection Switch to Side _" (-4)

4 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Important! The newly installed circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes—depending on other ongoing system activities..

5 Wait for this circuit pack to reinitialize.

6 From the *System View* , click on the **Update Alarms** button.

7 Does the list include this same STS768 circuit pack alarm?

If ...	Then ...
YES,	go to Step 10.
NO,	continue. **Important!** Although there is no requirement, some customers may prefer to keep service on Side 0 (Side 0 as Active) and Side 1 available for protection.

8 Do you have local operating procedures that stipulate something like "Normal operations, for 1+1 Equipment protection groups, should be maintained on Side 0"?

If ...	Then ...
YES,	you should perform a *Manual to Side 0* protection switch. **Reference:** "SE 563-2: Perform a Manual Protection Switch to Side 0" (-6)
NO,	continue.

9 *STOP! End of Task.*

10 Escalate to the next higher level of technical support.

ND OF STEPS

☐

SE 563-1: Perform a Manual Protection Switch to Side _

Task Perform the following steps to manually switch the switch fabric from the current active side to the current standby side.

1 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen expand/scroll down the directory until *1+1 Equipment esysswitchgrp* is displayed and highlighted.
4. Click on the **Select** button.
5. In the field labeled *Switch Type:*, click on the drop-down arrow and:
   - if ....*switch0-cp* is alarmed, then select **Manual to Side 1**, or
   - if ....*switch1-cp* is alarmed, then select **Manual to Side 0**.
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

   Important! The right-hand part of the screen will display the selected Protection Group AID: (for example, **_-_ esysswitchgrp**). Also, this display shows ....*switch0-cp* and ....*switch1-cp* AIDs, as well as their individual alarm status.

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-switch side, would cause the command to fail. If the command was successful, then the list will display `Protection Switch` (appropriate AID) `Successful`.

3 Was the *Manual Protection Switch* command successful?

If...	**Then...**
YES,	*STOP! End of Supporting Task.*
NO,	continue.

4 Escalate to the next higher level of technical support.

N D O F S T E P S

SE 563-2: Perform a Manual Protection Switch to Side 0

Task Perform the following steps to manually switch the I/O fabric from Side 1 to Side 0.

1 From the **System View** screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory until *1+1 Equipment esysswitchgrp* is displayed and highlighted.
4. Click on the **Select** button.

   NOTE: The left-hand part of the screen will display the selected *Protection Group AID*. Also, this display shows their individual alarm status.
5. In the field labeled **Switch Type:** click on the drop-down arrow and select *Manual to Side 0*.
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the `Manual to Side 0` command was successful.

> **Important!** Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like `Protection Switch` (appropriate AID) `successful`.

3 Was the `Manual Protection Switch` command successful?

If ...	Then ...
YES,	*STOP! End of Supporting Task.*
NO,	continue.

4 Escalate to the next higher level of technical support.

ND OF STEPS

Task 564: Clear 'OC192/STM64 Circuit Pack Failure'

Purpose

Use this task to:

- Obtain the identity of an alarmed OC192/STM64 circuit pack.
- Replace the alarmed circuit pack.
- Verify that the alarm has been cleared.

Required equipment

Use the following equipment to complete this task:

- WaveStar® Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement OC192/STM64 circuit pack.

Important considerations

Important! If the OC-192 circuit pack is part of a 4-fiber BLSR port protection group, then it will be necessary to perform a *Manual to Protection, Span* switch before removing the circuit pack. As a contrast, if the OC-192 circuit pack is part of a 2-fiber BLSR port protection group, then it will be necessary to perform a *Manual to Protection, Ring* switch before removing the circuit pack.

Review and consider the items listed below when a circuit pack failure alarm occurs.

1. An OC192/STM64 circuit pack can only be used in a 0x1 (nonprotected) equipment configuration. However, the nonprotected circuit pack may be used to support facilities that are:
   a. BLSR protected,
   b. 1+1 protected,
   c. 0x1 nonprotected, or
   d. Protected at the far-end user location.
2. Regarding revertive and nonrevertive switching:
   a. For 1+1 facilities, upon failure of the working circuit pack service will be automatically switched to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive.*
3. For 1+1 facilities the defaults are:

- Nonrevertive (but can be provisioned as revertive).
- At initial start-up of an NE, service is provided by the *working* line.
- At initial provisioning, service is provided by the *working* line.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin

Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.
2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task

Perform the following steps to clear an *OC192/STM64 Circuit Pack Failure* alarm.

---

1 From the Alarm List, determine the AID of the failed circuit pack.

Important! The OC192/STM64 circuit pack may be part of: (a) BLSR facilities protection group, (b) part of a 1+1 facilities protection group, or (c) part of a 0x1 nonprotected group. Regardless of the type of facilities protection, the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted.

---

2 Is the failed circuit pack part of a BLSR or 1+1 facilities protection group?

If…	Then…
YES,	continue with Step 3.
NO,	go to Step 12.

3 From the *System View* screen:

1. Click on **View-Protection**.
2. Click on the tab labeled **Prot Grp** (which is the default tab).
3. In the Windows-like explorer screen, expand down the directory until the desired protection group (for example, *_F BLSR* ..., or *1+1 Optical* ...) is displayed. Then highlight the protection group.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted,
   - and for a 1+1 protection group, the **Switch Request State:** equals *Signal Failure* is enough to replace a defective circuit pack
   - and for a BLSR protection group, the **Ring Node APS (Automatic Protection Switch) State:** equals *Active* is enough to replace a defective circuit pack.

Reference: "SE 564-1: Perform a Manual Protection Switch" (-6)

4 For the *View Protection* screen and for the field that is labeled (*Switch Request State:* "Is *Signal Failure* listed) or (**Ring Node APS [Automatic Protection Switch] State:** Is *Active* listed)?"

If…	Then…
YES,	a protection switch is in effect. Continue with Step 5
NO,	you should perform a *Manual Protection Switch*. **Reference:** "SE 564-1: Perform a Manual Protection Switch" (-6)

Important! The OC192/STM64 is a single port type circuit pack. Therefore, for the application where it is supporting a BLSR facility protection group or a 1+1 facility protection group, all traffic will be automatically switched to the other circuit pack upon declaring an OC192/STM64 circuit pack failure.

5 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack.
2. Physically unlatch and remove the alarmed circuit pack.
3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the fibers.

Important! The newly installed OC192/STM64 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes, depending on other ongoing system activities.

6 Wait for this circuit pack to initialize.

7 Click on the **Alarm List** button.

8 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11.
NO,	continue.

9 Did you perform a *Manual Protection Switch* in Step 4?

If…	Then…
YES,	you should perform a *Clear Protection Switch*. **Reference:** "SE 564-2: Clear protection switch" (-9)
NO,	continue.

10 *STOP! End of Task.*

11 Escalate to the next higher level of technical support.

Important! For the 0x1 OC192/STM64 applications, a circuit pack failure means a complete loss of service on this particular facility.

12 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack.
2. Physically remove the failed circuit pack (AID from Step 1).
3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the fibers.

Important! The newly installed OC192/STM64 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes, depending on other ongoing system activities.

13 Wait for this circuit pack to initialize.

14 Click on the **Alarm List** button.

15 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11.
NO,	go to Step 10.

ND OF STEPS

SE 564-1: Perform a Manual Protection Switch

Task Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

1 Is the OC-192 circuit pack a member of a *4f BLSR*?

If…	Then…
YES,	go to Step 3.
NO,	continue with Step 2.

2 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *2F BLSR* ...) is displayed. Then, highlight the appropriate protection group.
4. Click on the **Select** button.
5. If BLSR *East Port AID* is alarmed, then
   - for the field that is labeled *Direction:* select

     West
   - for the field that is labeled *Switch Type:* select

     Manual to Protection, Ring

     OR
6. If 1+1.... *Working AID* is alarmed, then
   - for the field that is labeled *Switch Type:* select

     Manual to Protection
7. Click on the **Apply** button.
8. Read the information message and, as appropriate, click on the **YES** button.

3 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *4F BLSR* ...) is displayed. Then, highlight the appropriate protection group.
4. Click on the **Select** button.
5. If ....*West Working Port AID*..... is alarmed, then
   - for the field that is labeled *Direction:* select

     West
   - for the field that is labeled *Switch Type:* select

     Manual to Protection, Span

     OR
6. If ....*East Working Port AID*..... is alarmed, then
   - for the field that is labeled *Direction:* select

     East
   - for the field that is labeled *Switch Type:* select

     Manual to Protection, Span
7. Click on the **Apply** button.
8. Read the information message and, as appropriate, click on the **YES** button.

---

4 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

> **Important!** Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display *Protection Switch* (appropriate AID) *Successful*.

5 Was the *Manual Protection Switch* command successful?

If…	**Then…**
YES,	*STOP! End of Supporting Task.*
NO,	continue.

6 Escalate to the next higher level of technical support.

ND OF STEPS

SE 564-2: Clear protection switch

Task Perform the following steps to *Clear* an existing manual protection switch.

1 From the *System View* screen:

1. Select **Fault-Protection Switch**.
2. Click on the tab labeled **Ptn Grp**.
3. In the Windows-like explorer, expand down the directory until the desired AID is shown.
4. Click to highlight the desired AID.
5. Click on the **Select** button.
6. For the field that is labeled *Direction:*, refer to what was previously manually switched in SE 564-1. As appropriate, select either *East* or *West*.
7. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type:*.
8. Click on **Clear**.
9. Click on the **Apply** button.
10. Read the information in the *Caution* box and then click on the **YES** button.
11. Click on the **Close** button.

ND OF STEPS

Task 567: Clear ‘PPROCSTS192 Circuit Pack Failure’

Purpose

Use this task to:

- Obtain the identity of an alarmed PPROCSTS192 circuit pack.
- Replace the alarmed circuit pack.
- Verify that the alarm has been cleared.

Required equipment

Use the following equipment to complete this task:

- WaveStar® Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement PPROCSTS192 circuit pack.

Important considerations

Review and consider the items listed below when a circuit pack failure alarm occurs.

1. A Pointer Processor circuit pack is always paired/mated with an OC-192 circuit pack. Thus, it is referred to with the acronym/name PPROCSTS192. A PPROCSTS192 circuit pack can only be used in a 0x1 (nonprotected) equipment configuration. However, the nonprotected circuit pack may be used to support facilities that are:
   - 1+1 protected,
   - BLSR protected
   - 0x1 nonprotected, or
   - Protected at the far-end user location.
2. Regarding revertive and nonrevertive switching:
   - For 1+1 facilities, upon failure of the working circuit pack service will be automatically switched to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive.*
   - For 1+1 facilities the defaults are:
     — Nonrevertive (but can be provisioned as revertive)
     — At initial start-up of an NE, service is provided by the *working* line

— At initial provisioning, service is provided by the *working* line.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin

Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.
2. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task

Perform the following steps to clear a PPROCSTS192 *Circuit Pack Failure* alarm.

1 From the Alarm List, determine the AID of the failed circuit pack.

Important! The PPROCSTS192 circuit pack may be part of: (a) BLSR facilities protection group, (b) part of a 1+1 facilities protection group, (b) part of a 1+1 facilities protection group, or (c) part of a 0x1 nonprotected group. Regardless of the type of facilities protection, the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted.

2 Is the failed circuit pack part of a BLSR or 1+1 facilities protection group?

If…	Then…
YES,	continue with Step 3.
NO,	go to Step 12

3 From the *System View* screen, do the following:

1. Click on **View-Protection**.
2. Click on the tab labeled **Prot Grp** (which is the default tab).
3. In the Windows-like explorer screen, expand down the directory until the desired protection group (for example, *_F BLSR ...*, or *1+1 Optical ...*) is displayed. Then highlight the protection group.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted,
   - and for a 1+1 protection group, the *Switch Request State:* equals *Signal Failure* is enough to replace a defective circuit pack
   - and for a BLSR protection group, the *Ring Node APS (Automatic Protection Switch) State:* equals *Active* is enough to replace a defective circuit pack.

---

4 For the *View Protection* screen and for the field that is labeled *(Switch Request State:* Is *Signal Failure* listed?) or (*Ring Node APS (Automatic Protection Switch) State:* Is *Active* listed?

If…	**Then…**
YES,	a protection switch is in effect. Continue with Step 5
NO,	you should perform a *Manual Protection Switch*. **Reference:** "SE 567-1: Perform a Manual Protection Switch" (-6)

---

5 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack
2. Insert a known good replacement circuit pack.

Reference: Task 700: How to properly remove a circuit pack

Important! The newly installed PPROCSTS192 circuit pack should initialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes, depending on other ongoing system activities.

6 Wait for this circuit pack to initialize.

7 Click on the **Alarm List** button.

8 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11
NO,	continue.

9 Did you perform a *Manual Protection Switch* in Step 5?

If...	Then...
YES,	you should perform a *Clear Protection Switch*. **Reference:** "SE 567-2: Clear Protection Switch" (-8)
NO,	go to Step 12

10 *STOP! End of Task.*

11 Escalate to the next higher level of technical support.

12 Instruct the on-site craft to:

1. Physically remove the failed circuit pack (AID from Step 1).
2. Insert a known good replacement circuit pack.

Reference: Task 700: How to properly remove a circuit pack

Important! The newly installed PPROCSTS192 circuit pack should initialize (green LED blinks and clears, and then no red LED) in in approximately 2 minutes – depending on other ongoing system activities..

13 Wait for this circuit pack to initialize.

14 Click on the **Alarm List** button.

15 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	go to Step 11
NO,	go to Step 10

N D O F S T E P S

SE 567-1: Perform a Manual Protection Switch

Task Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

1 Is this Pointer Processor circuit pack mated to an OC-192 that is a member of a 4f BLSR?

If…	**Then…**
YES,	go to Step 3.
NO,	continue with Step 2.

2 From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp** (which is the default tab).
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *2f BLSR* ...) is displayed. Then, highlight the appropriate protection group.
4. Click on the **Select** button.
5. If .... *East Port AID*.... is alarmed, then
   - for the field that is labeled *Direction:* select
     West
   - for the field that is labeled *Switch Type:* select
     Manual to Protection, Ring
6. Click on the **Apply** button
7. Read the information message and, as appropriate, click on the **YES** button.

3 Refer back to the *System View* screen, and determine from the Command List (which is the drop-down list immediately below the menu bar) whether the *Manual to Side* _ command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display `Protection Switch` (appropriate AID) `Successful`.

4 Was the *Manual Protection Switch* command successful?

If…	**Then…**
YES,	*STOP! End of Supporting Task.*
NO,	continue.

5 Escalate to the next higher level of technical support.

ND OF STEPS

SE 567-2: Clear Protection Switch

Task Perform the following steps to *Clear* an existing Manual Protection Switch.

1 From the *System View* screen:

1. Select **Fault-Protection Switch**.
2. In the Windows-like explorer, expand down the directory until the desired AID is shown.
3. Click to highlight the desired AID.
4. Click on the **Select** button.
5. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type:*.
6. Click on **Clear**.
7. Click on the **Apply** button.
8. Read the information in the Caution box and then click on the **YES** button.
9. Click on the **Close** button.

ND OF STEPS

☐

Task 571: Clear Loss of Multiframe (LOM) Alignment

Purpose

Use this procedure to clear a "Loss of Multiframe (LOM) Alignment" alarm.

Required privilege code

You must have at least an M1 in order to complete this task.

Required equipment/ personnel

The following are required in order to complete this task:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap.

Equipment which may be needed

Depending on certain results, the on-site craft may need a replacement Gigabit Ethernet circuit pack.

Task

Important! It is important to understand that any system or network interruption of Ethernet traffic which last more than 5-ms will result in producing this alarm. Thus, some (but not all) protection switches can result in a LOM. 1+1 links should be designed so that upon switching this delay constraint will not be exceeded.

Complete the following steps to clear a "LOM alarm".

1 From the **Alarm List**, determine the AID of the circuit pack which indicates the LOM alarm.

2 Based on the information obtained in Step 1, determine whether there also exists an LOS alarm for this same AID.

Does the Alarm List indicate a LOS for the LAN Port (subject AID)?

If...	Then...
YES,	clear the LOS alarm with Task 543 and only return here as necessary.
NO,	continue.

3 Determine whether a protection switch is active.

From the *System View* screen select **Reports>NE Protection Switching Activity Log**

If…	Then…
YES,	what to do- don't know (ask Tom)
NO,	continue.

4 From office records, or otherwise, obtain an end-to-end diagram of the transport facilities used to complete the Ethernet link.

5 Analyze the end-to-end diagram and determine whether there are intermediate nodes.

Are there intermediate nodes?

If...	Then...
YES,	continue.
NO,	Go to Step 8.

6 Sequentially, login to the next adjacent node and check that node's Protection Switching Activity log for active or historical entries involving the subject link.

Does the current intermediate node's log list these activities?

If…	Then…
YES,	what to do- don't know (ask Tom)
NO,	continue.

7 Are there other intermediate nodes?

If...	Then...
YES,	go to Step 6.
NO,	continue.

8 Login back in to the node that is exhibiting the LOM alarm. From the System View click in the **Alarm List** button

Does the list still include the LOM alarm?

If...	Then...
Yes,	Instruct the on-site craft to reset the 1GE circuit pack by pulling out and re-seating.
NO,	**Stop! End of task**.

9 Wait approximately 2-minutes for this circuit pack to reboot and for the LED on it's faceplate to return to a steady Green. Then, click on the **Update Alarms** button.

10 Does the Alarm List still include the LOM alarm?

If...	Then...
YES,	Instruct the on-site craft to replace the 1GE circuit pack with a known good same code circuit pack.
NO,	**Stop! End of task**.

11 Wait approximately 2-minutes for this circuit pack to reboot and for the LED on it's faceplate to return to a steady Green. Then, click on the **Update Alarms** button.

Is the LOM alarm still included in this list?

If...	**Then...**
YES,	Escalate to your next higher level of technical support.
NO,	**Stop! End of task.**

ND OF STEPS

Task 572: Clear ALS (Automatic Laser Shutdown)

Purpose

Use this procedure to clear an Automatic Laser Shutdown (ALS) alarm.

The ALS alarm is a safety feature of the Optical Booster Amplifier (OBA). The ALS alarm is active whenever there is NOT an input signal to the OBA. For example:

- Source transmitter (OC-192 or OC-48 circuit pack) has failed
- Fiber at the receiver on the OBA has been disconnected
- One or both optical connectors are contaminated
- Optical cable between the OBA and the OC-192/OC48 circuit pack is defective.

Important! Once the equipment failure has been repaired, normal operations are automatically restored.

Required privilege code

You must have at least an M1 in order to complete this task.

Required equipment/ personnel

The following are required in order to complete this task:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap
- Optical Power Meter to measure the level of received or transmitted power
- Appropriate Optical LBOs
- On-site assistance at the reporting NE.

Before you begin

Observe the following:

- Look for standing alarms that can be attributed to ALS. For example, if there is a Loss of Signal (LOS) alarm on the associated (feeding) circuit pack, it could be the cause for this ALS.
- ALS is always enabled, and there are no provisionable options.

Task

Complete the following steps to clear an ALS alarm.

1 From the WaveStar CIT *System View* screen, click on the **Alarm List** button.

Important! Observe the column labeled *AID* and subsequent entry for the ALS alarm, and determine whether the feeding circuit is exhibiting a *Probable Cause* alarm of LOS.

2 Is the feeding circuit alarmed with an LOS?

If…	**Then…**
YES,	the LOS must be cleared NOW. **Reference:** T 543
NO,	continue.

3 Determine whether the OBA is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

Reference: T 712

4 Is the power level within proper limits for the OBA?

If…	**Then…**
YES,	continue.
NO,	re-connect the IN fiber connector and then go to Step 11.

5 Instruct the on-site craft to reconnect the fiber to the OBA's IN connector.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be a defective OBA circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, replace the OBA circuit pack.

6 From the *System View* screen, click on the **Update Alarms** button.

7 Does the *Alarm List* still display the same ALS?

If…	**Then…**
YES,	continue.
NO,	*STOP! End of Task*.

8 Instruct the on-site craft to replace the OBA circuit pack.

9 From the *System View* screen, click on the **Update Alarms** button.

10 Does the *Alarm List* still display the same ALS?

If…	**Then…**
YES,	escalate to your next higher level of technical support.
NO,	*STOP! End of Task.*

11 Instruct the on-site craft to measure the power level at the OUT port of the feeding circuit pack (OC-192 or OC-48).

Reference: T 712

12 Is the power level within proper limits for this type of circuit pack?

If…	**Then…**
YES,	continue.
NO,	that circuit pack (OC-192 or OC-48) should be replaced. Continue with Step 9.

13 Instruct the on-site craft to replace the optical cable “jumper” between the OBA and its feeding circuit pack. Continue with Step 9.

ND OF STEPS

Task 573: Clear ‘Local Squelch Map Conflict’

Purpose

The network element uses the squelch map during ring protection switching. Each cross-connection on the ring is provisioned with a source NE TID (“locA” in TL1 terms) and a destination NE TID (“locZ” in TL1 terms). When one or more of these values is invalid (meaning, that it is NOT in the ring where the cross-connection resides) the NE reports a *Local Squelch Map Conflict* alarm. This alarm may occur when mult-ring traffic is provisioned incorrectly. Use this procedure to clear the alarm by modifying the appropriate cross-connection(s).

> **Important!** Although this alarm is most likely to occur when cross-connections are being provisioned using TL1 commands it can also occur when an incorrect TID was entered (typed in from the keyboard - such as before the fibers were connected and thus before any graphical list is available). Thereafter (after the fibers have been connected and a ring-map has been established) the graphical interface of the CIT does not allow you to enter invalid locA and locZ values. (You can only select source and destination NEs from a drop down. These may be incorrect for your cross-connection but not invalid in terms of the ring map).

Required equipment

The following equipment is required to perform this task:

- WaveStar CIT or another interface that can send TL1 commands to the BandWidth Manager

Related information

For related information, see the following:

- “Determining LocA and LocZ for Multi-Ring Traffic” in Chapter 2 of this manual

Example alarm (TL1 format)

```
1-2-t01,OC192:MN,SQMAP-CONFL,NSA,08-06,14-47-32:\"Commu-
nications, BLSR prot grp, Local Squelch Map Conflict\"
```

This indicates that the conflict involves bay 1 and shelf 2, protection group `t01`.

Task summary The following steps summarize this task:

1. For single ring traffic, make a list of the NE TIDs in the ring. For multiple ring traffic, draw a map and table of the traffic. Refer to the Related information section(s) if necessary. Use your map and table as a guide for the rest of this task.
2. Make sure that each locA and locZ value in each cross-connection is in fact a TID of an NE in the ring and that the NE is the correct one.

Task details Complete the following steps to clear a "Local Squelch Map Conflict" alarm.

---

1 Make a note of the protection group AID listed in the alarm message. In our example above it is `1-2-t01`.

---

2 Do one of the following:

If...	Then...
your traffic traverses more than one ring	go to step 4
your traffic traverses only one ring	go to step 3

---

3 Make a list of the NE TIDs in your ring. It may help to use a RTRV-MAP-RING command similar to the following TL1 example:

Example: `RTRV-MAP-RING:CHICAGO:1-2-tØ1:ctag1`

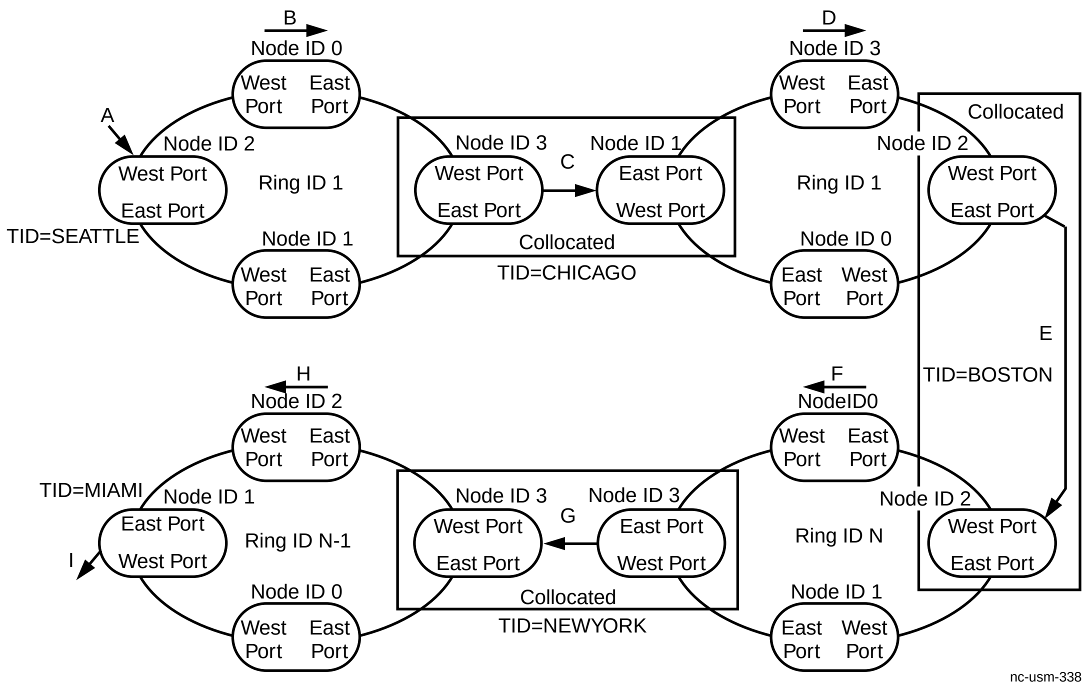
The output includes information in curly braces {}. The first field in each set of braces is a TID for one of the NEs in the ring.

---

4 Draw a map and table similar to the example below for the traffic you intend to provision. If you have doubts about which NEs to select as sources or destinations, see “Determining LocA and LocZ for Multi-Ring Traffic” in Chapter 2.

Example:

The following figure shows traffic that traverses several BLSRs.



XConn	Type	LocA	LocZ
A	Add	none	CHICAGO
B	Through	SEATTLE	CHICAGO
C	Ring-to-Ring	SEATTLE	BOSTON
D	Through	CHICAGO	BOSTON
E	Ring-to-Ring	CHICAGO	NEWYORK
F	Through	BOSTON	NEWYORK
G	Ring-to-Ring	BOSTON	MIAMI
H	Through	NEWYORK	MIAMI
I	Drop	NEWYORK	none

5 The conflict could be caused by any one or more cross-connections on the ring whose protection group is identified in the alarm message. To get a list of all cross-connections on that ring, enter a RTRV-CRS command. For example, for our example above you could enter the following TL1 command:

Example: `RTRV-CRS-ALL:CHICAGO:1-2-tØ1-all-all-all:ctag1;`

The output for each cross-connection looks similar to the following:

```
"1-2-u-#-12-1,1-2-t01-ww-04-02:STS3:OMODE=NORM,
LOCA=SEATTLE, SQFA=MVALID,LOCZ=MIAMI,SQFZ=MINVALID,
REPLEG=2WAY,LPBKSTAT=NO,TACCSTAT=NO,XCAPPL=10,
XCNUM=011031001"
```

6 The output from the RTRV-CRS includes the locA and locZ values. Compare these against the list you made in step 3 or the table you made in step 4 to determine which cross-connections need to be modified.

Important! Correcting the locA/locZ values for all cross-connections that show SQFA=MINVALID or SQFZ=MINVALID would clear the alarm. But note that you could also have a locA or locZ value that is valid, because it is in the ring map, but is not the correct destination NE.

7 Use the ED-CRS command to modify a problematic cross-connection. The following TL1 example modifies the locZ value of a cross-connection.

Example: `ED-CRS-STS3:SEATTLE:1-2-u-#-12-1,1-2-tØ1-ww-Ø4-Ø2:ctag1:::LOCZ=CHICAGO;`

8 Repeat step 7, if necessary, for each problematic cross-connection.

9 Use the RTRV-ALM command to verify that the SQMAP-CONFL alarm does not appear. You may want to narrow down the alarm list by specifying the AID of the protection group as in the TL1 example below.

Example: RTRV-ALM:SEATTLE:1-2-t01::ctag1;

10 Verify that your cross-connections are correct by repeating the RTRV-CRS command that you performed in step 5 and comparing the locA and locZ values to the table that you created.

END OF STEPS

Task 574: Clear VCG Loss of Alignment (LOA)

Purpose

Use this procedure to clear a “VCG Loss of Alignment (LOA)” alarm.

Required privilege code

You must have at least an M1 in order to complete this task.

Required equipment/ personnel

The following are required in order to complete this task:

- *WaveStar*™ Craft Interface Terminal (CIT)
- Wrist strap.

Equipment which may be needed

Depending on certain results, the on-site craft may need a replacement Gigabit Ethernet circuit pack.

Task

> **Important!** It is important to understand that any system or network interruption of Ethernet traffic which last more than 5-ms will result in producing this alarm. Thus, some (but not all) protection switches can result in a LOM. 1+1 links should be designed so that upon switching this delay constraint will not be exceeded.

Complete the following steps to clear a “LOM alarm”.

1 From the **Alarm List**, determine the AID of the circuit pack which indicates the LOM alarm.

2 Based on the information obtained in Step 1, determine whether there also exists an LOS alarm for this same AID.

Does the Alarm List indicate a LOS for the LAN Port (subject AID)?

If...	Then...
YES,	clear the LOS alarm with Task 543 and only return here as necessary.
NO,	continue.

3 Determine whether a protection switch is active.

From the *System View* screen select **Reports>NE Protection Switching Activity Log**

If…	Then…
YES,	what to do- don't know (ask Tom)
NO,	continue.

---

4 From office records, or otherwise, obtain an end-to-end diagram of the transport facilities used to complete the Ethernet link.

---

5 Analyze the end-to-end diagram and determine whether there are intermediate nodes.

Are there intermediate nodes?

If...	Then...
YES,	continue.
NO,	Go to Step 8.

---

6 Sequentially, login to the next adjacent node and check that node's Protection Switching Activity log for active or historical entries involving the subject link.

Does the current intermediate node's log list these activities?

If…	Then…
YES,	what to do- don't know (ask Tom)
NO,	continue.

---

7 Are there other intermediate nodes?

If...	Then...
YES,	go to Step 6.
NO,	continue.

8 Login back in to the node that is exhibiting the LOM alarm. From the System View click in the **Alarm List** button

Does the list still include the LOM alarm?

If...	Then...
Yes,	Instruct the on-site craft to reset the 1GE circuit pack by pulling out and re-seating.
NO,	**Stop! End of task**.

9 Wait approximately 2-minutes for this circuit pack to reboot and for the LED on it's faceplate to return to a steady Green. Then, click on the **Update Alarms** button.

10 Does the Alarm List still include the LOM alarm?

If...	Then...
YES,	Instruct the on-site craft to replace the 1GE circuit pack with a known good same code circuit pack.
NO,	**Stop! End of task**.

11 Wait approximately 2-minutes for this circuit pack to reboot and for the LED on it's faceplate to return to a steady Green. Then, click on the **Update Alarms** button.

Is the LOM alarm still included in this list?

If...	Then...
YES,	Escalate to your next higher level of technical support.
NO,	**Stop! End of task.**

ND OF STEPS

Task 575: Clear '1GE Circuit Pack Failure'

Purpose

Use this task to:

- Obtain the identity (AID) of the alarmed 1GE circuit pack.
- Replace the alarmed circuit pack.
- Verify that the alarm has been cleared.

Required equipment

Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement 1GE circuit pack.

Before you begin

Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.
2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task

Perform the following steps to clear a *1Gigabit Ethernet Circuit Pack Failure* alarm.

1 From the Alarm List, determine the AID of the failed circuit pack.

2 Instruct the on-site craft to:

1. Disconnect the fibers from the subject circuit pack.
2. Physically unlatch and remove the alarmed circuit pack.
3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the fibers.

Important! The newly installed 1GE circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes, depending on other ongoing system activities.

3 Wait for this circuit pack to initialize.

4 Click on the **Alarm List** button.

5 Does the list include this same circuit pack failure alarm?

If…	Then…
YES,	continue...
NO,	**Stop! End of Task**.

6 Escalate to the next higher level of technical support.

ND OF STEPS

Task 576: Clear 'C-bit Mismatch'

Purpose

Use this task to:

- Obtain the identity (AID) of the alarmed DS3 port.
- Identify the source of the problem.
- Verify that the alarm has been cleared.

Required equipment

Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT).

Before you begin

Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to any NE on the subject ring.
2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task

Perform the following steps to clear a *C-bit Parity* alarm.

1 From the Alarm List, determine the AID of the alarmed DS3 port.

2 Obtain a copy of the Office Records for the subject AID (port) and, from those records, determine which **DS3 Signal Format** should be provisioning.

Important! The four possible DS3 Signal Format options are: (a) unframed, (b) C-bit Parity, (c) M23, and (f) Framed.

3

If Office Records indicate ...	Then...
C-bit parity	the problem is with the upstream NE. Go to Step 8.
unframed, M23, or Framed	the local NE is at fault and it's provisioning should be changed from "C-bit Parity" to the correct type of DS3 Signal format. Continue.

4

If your login ...	Then ...
permits you to make provisioning changes	from the *System View* screen (a) highlight the subject DS3 port, (b) right-click and select submenu item **Provision Port ___**, (c) in the field that is labeled **DS3 Signal Format** change from *C-bit Parity* to the appropriate parameter.
does NOT permit you to make provisioning changes	contact the appropriate provisioning organization and ask that they make the identified provisioning changes and to inform you whenever they have completed.

5 Click on the **Update Alarms** button.

6 Does the list still include this same **C-bit Parity** alarm?

If…	Then…
YES,	continue...
NO,	*Stop! End of Task.*

7 Escalate to the next higher level of technical support.

Important! Depending upon the particular network, the upstream NE may be provisioned by yourself or others.

8 As appropriate, contact those that are responsible for provisioning the upstream NE. Inform them that the signal they are sending is NOT **C-bit Parity**, as required. Ask that the provisioning be changed and for them to inform you whenever they have completed. Continue with Step 5.

ND OF STEPS

Part IV

Supporting Tasks

Task 700: How to properly remove a circuit pack

Purpose

On-site craft should use this procedure when removing a circuit pack from the shelf.

Reason to use this task

Each circuit pack, depending on its type, has either one or two latches. Each latch has a microswitch which is opened or closed according to the physical position of the latch. The system controller needs to know the status of this microswitch in order to manage certain real-time system functions. Typically, and as a worse case scenario, it will take the system controller a maximum of 5 seconds to recognize and respond to a latch open or close. Any latch can be opened without removing the circuit pack from the backplane connector.

Important! Reiterating, do not remove a circuit pack in one continuous operation. More specifically, (a) open the latch in order to operate the microswitch, (b) wait 5 seconds, and as appropriate (c) open the latch/latches fully and gently pull the circuit pack from it's slot.

Required tools/equipment

ThIssue 6e following items are required (on-site) in order to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Appropriate replacement circuit pack.

Safety precautions

To assure both personal safety and the proper functioning of the equipment it is imperative to review and understand this and any precautions prior to performing this task.

CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar TDM 10G system, to prevent electrostatic discharge damage to sensitive components.

Task Complete the following steps to replace a circuit pack.

1 Locate the static wrist strap and place on the appropriate wrist.

2 If the circuit pack is one of the optical I/O packs — then all fibers should be removed before operating either latch mechanism.

Important! Prior to beginning this task, the on-site craft must have available, if applicable, the replacement circuit pack.

3 Instruct the on-site craft to:

1. Operate latch momentarily.
2. Wait 5 seconds for the system controller to recognize the latch operation.

4 Instruct the on-site craft to apply equal force to both upper and lower latches, if equipped, or force on the one latch and gently slide the circuit pack from the slot.

5 Instruct the on-site craft to place the removed circuit pack in a static bag/box for safe storage and, as applicable, shipping.

6 As appropriate, insert the new/replacement circuit pack into the vacant slot.

7 Remove the static wrist strap and properly store it.

N D O F S T E P S

Task 702: Remove/Insert a PCMCIA (NVM) Card

Purpose

Use this procedure to:

1. Remove an NVM card from the CTL/SYS50DM circuit pack, and/or
2. Insert an NVM card into the CTL/SYS50DM circuit pack.

Important! You can use this procedure to remove an NVM card regardless of the operational state of the CTL/SYS50DM circuit pack.

As long as the CTL/SYS50DMcircuit pack is not equipped with an NVM card, the user can insert an NVM card conditional that the circuit pack's LED is not red.

Conventions used in this task

PCMCIA is an interface standard. There is a variety of different I/O cards that are built with a PCMCIA interface; for example, modem cards, local area network (LAN) cards, and Non-Volatile Memory (NVM) cards. Within this task, the term NVM is used exclusively to mean the 220-megabyte card memory that provides a PCMCIA interface.

Important! Another possible point of confusion is that the craft may, at times, encounter the term flash memory. The term flash memory is synonymous with NVM.

Related information

For related information see *Chapter 2, Maintenance/Trouble Clearing* in this document .

Safety precautions

CAUTION

Do not ever remove an NVM card when the CTL/SYS50DM circuit pack's green LED is ON (either ON or blinking). Improper removal of an NVM card can result in damaged files *and the generation of information messages such as “lost clusters” and/or “missing/damaged sectors”.*

CAUTION

Do not ever remove the NVM card by applying manual force. The mechanical eject mechanism, be it under hardware control or software control, should always (after pressing the “Eject Button”) eject the NVM card.

CAUTION

Under normal circumstances, the only time to remove an NVM card is whenever the circuit pack is physically inserted in a shelf and the shelf is powered up. If a circuit pack will boot up and give a green LED, then, and under those circumstances, the craft should not make any attempt but to remove the NVM card using the “Eject Button”.

Before you begin

Before beginnning this task you should understand how the procedure *Remove an NVM Card* works during normal operations and how it should work during most types of failures.

SYS50DM

Normal operations are defined as whenever the CTL/SYS50DM circuit pack’s LED is steady or flashing green. Not normal operations are defined as whenever the green LED is extinguished or is NOT flashing green..

Important! The craft at the WaveStar CIT must have a *Maintenance Privilege Code* of at least M4, a *Security Privilege Code* of at least S4, and a *Provisioning Privilege Code* of at least P1 in order to access the WaveStar CIT command **Enter/Exit Maintenance Condition**.

Task Complete the following steps to insert and/or remove an NVM card.

1 Select an action from the following table:

If you wish to…	Then you must…
Remove an NVM card,	have a Work Instruction (WI) and purpose in mind for the remove operation (for example, to create a backup NVM, to clear an alarm, and so forth). **Reference:** “SE 702-1: Remove an NVM Card” (-4)
Insert an NVM card,	have, in-hand, an NVM card of known origin and known condition and physically insert it into the identified CTL/SYS50DM circuit pack. **Reference:** “SE 702-2: Insert an NVM Card” (-6)

ND OF STEPS

SE 702-1: Remove an NVM Card

Perform the following steps to remove an NVM card.

Important! The NE must be in MCOND before removing an NVM card

1 At the WaveStar CIT, select **Fault-Enter/Exit Maintenance Condition** and click.

Important! After clicking on the **YES** button, the following information message is displayed: "Execution of Enter Maintenance Condition may affect the NE Service. Do you want to execute this command?" As appropriate, left-click on the **YES** button.

If you executed the command (click on the **YES** button) then the System View window command list box should display "Enter/ Exit Maintenance Condition (system) Successful".

Result: The dialog box **Enter/Exit Maintenance Condition** and the current Maintenance Condition (ON or OFF) are displayed. As appropriate, select the button labeled "**Enter Maintenance Condition**" and left-click on the **YES** button.

2 Located on the front and near the middle of the CTL/SYS50DM circuit pack is an Eject Button. With your finger, press the Eject Button. Refer to Figure 702-1, "Front/Faceplate View of the SYS50DM Circuit Pack" (-5).

Important! If the associated CTL/SYS50DM is rebooting while the Eject Button is being pressed, then it will be necessary to: (a) wait until the reboot completes, (b) place the node in Maintenance Condition, and (c) subsequently press the Eject Button again.

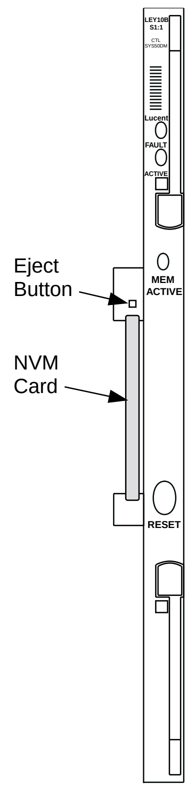
Result: After a few seconds the CTL/SYS50DM circuit pack's green LED should go off, and the mechanical eject mechanism should eject the NVM card.

3 Place your fingers on the card, and gently pull the NVM card from its slot.

Result: Disposition of the NVM card is determined by the WI, local operating procedures, and/or actual condition of the NVM card.

N D O F S T E P S

Figure 702-4 Front/Faceplate View of the SYS50DM Circuit Pack



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SE 702-2: Insert an NVM Card

Perform the steps below to insert an NVM card.

Important! All PCMCIA NVM cards have the same physical size and will fit into any PCMCIA slot. However, not all NVM cards have the same capacity. Different WaveStar products require different capacity NVM cards. Be sure to obtain the correct capacity NVM card for the application. Also, be sure that the card is correct for the subject NE.

1 Per the WI, or otherwise, obtain an NVM card and verify that it is appropriate (for example, correct generic/database and most recent backup) for the subject NE.

2 Orient the NVM card so that the writing on the card is left side up and the PCMCIA connector is the end that is to be inserted into the slot.

Important! The PCMCIA card should also have an arrow indicating the direction of movement for sliding into the slot.

3 Insert the NVM card into the slot, and operate the locking latch.

4 At the WaveStar CIT, select **Fault-Enter/Exit Maintenance Condition** and click.

Important! If you executed the command (left-click on the **YES** button), the System View window command list box should display “Enter/Exit Maintenance Condition (system) Successful”.

Result: The information message “Execution Exit Maintenance Condition may affect the NE service. Do you want to execute this command?”

ND OF STEPS

☐

Task 703: Clean Optical Fibers and Connectors

Purpose

Use this procedure to clean optical fibers and connectors.

> **Important!** All optical fiber connectors (*ST*®, SC, and FC types) should be cleaned before making initial connections or reconnections per the following instructions. Only the connectors being assembled at this particular time should be cleaned.
>
> To prevent contamination, keep all dust caps and plugs in place until you are instructed to remove them.

Required equipment

Use the following items to clean optical fibers and connectors:

- CLETOP reel type A or B
- CLETOP stick
- Optical quality tissue (TEXWIPE, *ABSORBOND*™ - TX404 or equivalent)
- Isopropyl alcohol (greater than 91% 2-propanol+water)
- Compressed gas (TX2510 AccuDuster III or equivalent)
- 300B microscope (comcode 104412077 — used for ST, SC, and FC type connectors)
- Optical power meter with appropriate connectors; for example, the HP8140A equipped with HP81401A (ITE#6550) or equivalent

Safety precautions

To assure both personal safety and the proper functioning of the WaveStar TDM 2.5G/10G system, it is imperative to review and understand these warnings and precautions prior to performing this task.

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.

WARNING

Eye damage may occur if energized fibers and connectors are viewed using the 300B microscope. Verify that fibers and connectors are de-energized using an optical power meter.

WARNING

Alcohol is flammable and is harmful if swallowed, inhaled, or absorbed through the skin. Keep alcohol away from heat, sparks, or flames. Avoid contact with eyes, skin, and clothing.

CAUTION

Do not shake or tilt the compressed gas container. Use short quick blasts.

Related information

For related information, see *Chapter 5, Circuit Pack/Port Unit Descriptions* in *WaveStar TDM 2.5G/10G User Operations Guide, 365-371-210*.

Before you begin Proper cleaning will eliminate exposure to dirt that may cause permanent damage to the connector. Once a connector has been permanently damaged, cleaning will not repair the damage. A damaged connector is suspected when, despite rigorous cleaning, power remains low in the system. Therefore, proper cleaning is critical.

If a connector is damaged it must be replaced by installing a new jumper cable and/or port unit, depending on where the damage has occurred. Typically both mating ends of the connector become damaged. This damage may be caused when connectors are engaged or disengaged while significant optical power (greater than 3.0 dBm) is present in the connection. Do not attempt to clean optically powered connectors.

Task Complete the following steps to clean optical fibers and connectors.

1

IF cleaning connector on…	THEN go to…
optical jumpers and pigtails,	Step 2.
port unit faceplates,	Step 13.

2 Remove the optical connector from the lightguide buildout/optical port or remove the dust cap from the optical connector.

3 *Cleaning Connectors on Optical Jumpers and Pigtails*

Using an optical power meter, verify that the connector and fiber to be cleaned has been deenergized/deactivated.

4 Using a microscope (for example, a 300B microscope), verify that the connector is clean.

> **Reference:** *SE 703-1: Verify Connector is Clean Using 300B Microscope*

5

IF the connector is…	THEN…
clean,	**STOP! End of Task.**

IF the connector is…	THEN…
not clean,	go to Step 6.

6 Using the CLETOP reel type A or B cleaner, clean the connector.

Reference: *SE 703-2: Clean Fiber Using CLETOP Reel Type A or B Cleaner*

7 Blow dry the connector ferrule with compressed gas. Hold the compressed gas can in an upright position while blow drying.

8 Using a microscope (for example, a 300B microscope), verify that the connector is clean.

Reference: *SE 703-1: Verify Connector is Clean Using 300B Microscope*

9

IF the connector is…	THEN…
clean,	**STOP! End of Task.**
not clean,	go to Step 10.

Important! Do not use tissue types other than the type specified in this procedure.

10 Clean (if necessary) the cylindrical surface and the endface of the connector ferrule with a tissue dampened with isopropyl alcohol. Wipe the tip of the ferrule several times in orthogonal (90 degree) directions with a sufficient amount of alcohol present on the tissue. Make sure that the tissue is resting on an unyielding surface while wiping the ferrule tip. Any unused areas of the same tissue can be used for subsequent cleanings. Discard tissue in an appropriate manner when finished.

11 Repeat Step 6 through Step 8.

12

IF the connector is…	THEN…
clean,	**STOP! End of Task.**
not clean,	repeat Step 10. If the connector remains dirty after performing Step 10 twice, discard the jumper.

Important! To prevent contamination, keep the optical ports covered with a dust cap or plug when not in use.

13 *Cleaning Connectors on Port Unit Faceplates*

Remove (if necessary) the lightguide buildout from its base (buildout block).

Reference: *Supporting Task 707: Install/Remove Lightguide Buildout*

14

IF the optical port on the faceplate is…	THEN go to…
removable (the optical port is not removable when no lightguide buildout is used),	Step 15
not removable (the optical port is not removable when no lightguide buildout is used),	Step 19.

15

IF the connector inside the faceplate is…	THEN go to…
accessible,	Step 16.
not accessible,	Step 19.

16 Using the the cleaning cloth that is present on the tip of CLETOP stick, carefully wipe the ferrule endface.

17 Remove the protector caps and plugs (if equipped) from the buildout and buildout block, and store them in a clean container.

18 Place the lightguide buildout into its base (buildout block).

Reference: *Supporting Task 707: Install/Remove Lightguide Buildout*

19 Use compressed gas to blow off any loose dirt on the tip of the ferrule or inside the sleeve. Hold the compressed gas nozzle one inch away from the tip of the ferrule or sleeve. Hold the compressed gas can in an upright position while blow drying.

ND OF STEPS

SE 703-1: Verify Connector is Clean Using 300B Microscope

Procedure Perform the following steps using the 300B microscope to verify the connector is clean.

CAUTION

Eye damage may occur if energized fibers and connectors are viewed using the 300B microscope. Verify that fibers and connectors are de-energized using an optical power meter.

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 the periphery.

2. Attach the connector to 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 spots, streaks, and fiber particles. To confirm that the observed spots are on the connector, slowly disconnect the connector while viewing it through the microscope, and verify that the black spots fade away as the connector is removed from the microscope.

ND OF STEPS

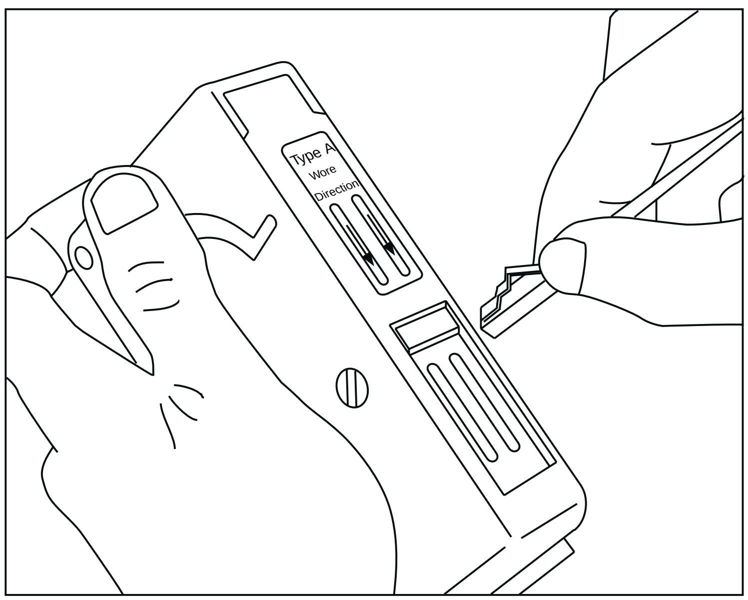
□

SE 703-2: Clean Fiber using CLETOP Reel Type A or B Cleaner

Procedure Perform the following steps to clean the connector using the CLETOP reel type A or B cleaner.

Important! The CLETOP reel type A cleaner has two slots, and the CLETOP reel type B cleaner has only one slot.

1 Hold the CLETOP reel type A or B cleaner in the palm of one hand with the cleaning side facing you.



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2 Using the thumb of the same hand that is holding the cleaner, press the lever all the way down and hold. Do not release the lever.

3 While holding the lever 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. Make sure that the endface is in contact with the cleaning cloth at all times, and that uniform force is used while dragging it.

4 Rotate the connector 90 degrees.

5

IF using the CLETOP reel…	THEN go to…
type A cleaner,	Step 6.
type B cleaner,	Step 8.

6 Press the ferrule endface against the cleaning cloth in the other slot of the CLETOP reel type A cleaner and uniformly drag it in the direction shown 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.

7 Release the lever and allow it to return to its initial position.

STOP! End of Supporting Element.

8 Release the lever of the CLETOP reel type B cleaner (allowing it to return to its initial position), and press the lever all the way down again and hold (advancing the cleaning cloth). Do not release the lever.

9 Press the ferrule endface against the cleaning cloth in the slot of the CLETOP reel type B cleaner and uniformly drag it in the direction shown 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.

10 Release the lever and allow it to return to its initial position.

N D O F S T E P S

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Task 704: Inspect (Repair) Optical and/or Electrical Cable(s)

Purpose Use this procedure to correct an input or output cable problem such as a damaged or disconnected cable.

Important! This procedure uses the word *cable* in a general sense to refer to either the electrical coax cable or to the optical fibers.

Related information For related information, see *Chapter 2, Maintenance/Trouble Clearing* in the *WaveStar TDM 2.5G (OC-48)/10G (OC-192) (2-Fiber) Alarm Messages and Trouble-Clearing Guide, 365-371-210*.

Task Complete the following steps to identify and repair any local cable problems.

1 As appropriate, remove the shelf front cover.

2 Verify that the cable(s) are properly connected.

3 Visually inspect each cable, starting at the connector on the local NE and going as far as practical (usually to an interconnection bay or to a cross-connect panel).

4 Follow local procedures to correct any problem(s) with the cable.

5 As appropriate, replace the front cover that was removed in Step 1.

N D O F S T E P S

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Task 705: Remove/Replace Shelf Cover

Purpose Use this procedure to remove or replace a shelf cover.

Required equipment A wrist strap is required to perform this task.

Safety precautions To assure both personal safety and the proper functioning of the WaveStar TDM 2.5G/10G system, it is imperative to review and understand these warnings and precautions prior to performing this task.

CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar TDM 2.5G/10G system to prevent electrostatic discharge damage to sensitive components. See "Electrostatic Discharge (ESD) Considerations" in the Safety Appendix.

Related information For related information, see *Chapter 3, Product Description* in *WaveStar TDM 2.5G/10G User Operations Guide, 365-371-210*.

Task Complete the following steps to remove or replace the shelf cover.

1

IF the cover is being…	THEN go to…
removed,	Step 2.
replaced,	Step 6.

2 At the bottom of the shelf cover, locate the two ¼-turn fasteners.

3 Use the appropriate size slotted screwdriver (or a dime) to rotate the ¼-turn fasteners counterclockwise 90 degrees so the slots are positioned vertically (unlocked position).

4 Grasp the cover and pull it forward until it is horizontal (rotated 90 degrees from the closed position).

5 Lift the pivot pins located at the top of the cover, push back, and lift up on the pins again to remove the cover from the shelf, then lift the cover up until it is free from the shelf framing.

Stop! End of Task.

6 Position the pivot pins located at the top of the cover under the flange on the shelf framing.

7 Close the cover and rotate the two ¼-turn fasteners 90 degrees clockwise using the screwdriver (or dime) until the fastener slots are horizontal (locked position).

ND OF STEPS

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Task 706: Replace a Defective Power Filter

The Process

The power filter contains only passive components. It is designed for maximum reliability. Currently, the power filter is not an orderable item, and thus no sparing policy exists.

What to do

Follow these instructions to replace a failed power filter.

If…	Then…
If a power filter fails,	contact a Lucent Technologies Customer Service Representative, and work out arrangements for obtaining a replacement.

Task 707: Install/Remove Lightguide Buildout

Purpose Use this procedure to install or remove a lightguide buildout (LBO).

Required equipment A wrist strap is required to perform this task.

Safety precautions To assure both personal safety and the proper functioning of the WaveStar TDM 2.5G/10G system, it is imperative to review and understand these warnings and precautions prior to performing this task.

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 TDM 2.5G/10G system to prevent electrostatic discharge damage to sensitive components. See "Electrostatic Discharge (ESD) Considerations" in the Safety Appendix.

Related information For related information, see:

- *Supporting Task 711, Select Lightguide Buildout*

For related information in *WaveStar TDM 2.5G/10G User Operations Guide, 365-371-210*, see:

- *Chapter 3, Product Description*
- *Chapter 5, Circuit Pack/Port Unit Descriptions*

Task Complete the following steps to install or remove a lightguide buildout (LBO).

1

IF the lightguide buildout is being…	THEN go to…
installed,	Step 2.
removed,	Step 4.

2 Remove the protector caps and plugs (if equipped) from the buildout and buildout block, and store them in a clean container.

3

IF the lightguide buildout is ...	THEN ...
ST, SC, or FC	Align the buildout with the slot in the buildout block, push in, and rotate clockwise until locked into position. **Reference:** *SE 707-1: Examples of Lightguide Buildouts and Buildout Blocks* **Reference: Stop! End of Task.**
LC	Align the buildout with the slot in the buildout block and push in until locked into position. **Reference:** *SE 707-1: Examples of Lightguide Buildouts and Buildout Blocks* **Reference: Stop! End of Task.**

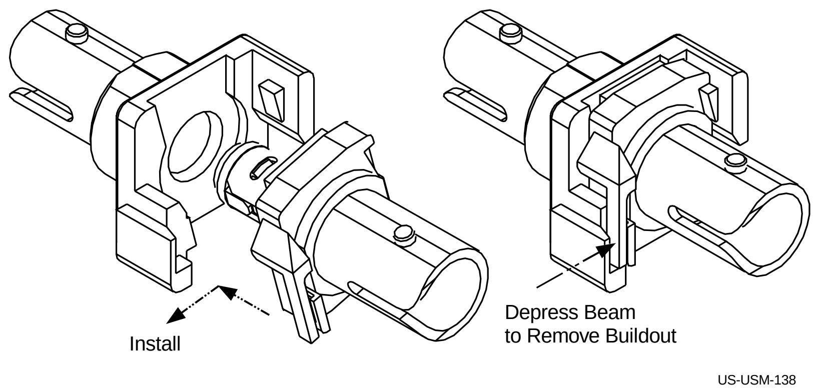
4

IF the lightguide buildout is ...	THEN ...
ST, SC, or FC	**CAUTION** *The locking beam must only be pushed along a line perpendicular to the buildout body in the direction towards the buildout in order to avoid damage to the locking beam.* Depress the locking beam on the buildout, rotate counterclockwise, and separate from the buildout block by sliding apart. **Reference:** *SE 707-1: Examples of Lightguide Buildouts and Buildout Blocks*
LC	**CAUTION** *The locking beam must only be pushed along a line perpendicular to the buildout body in the direction towards the buildout in order to avoid damage to the locking beam.* Depress the locking beam on the buildout and separate from the buildout block by sliding apart. **Reference:** *SE 707-1: Examples of Lightguide Buildouts and Buildout Blocks*

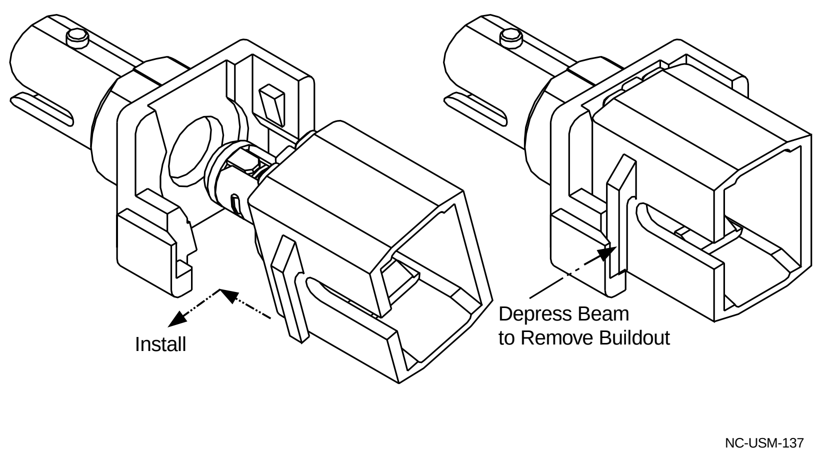
END OF STEPS

SE 707-1: Examples of Lightguide Buildouts and Buildout Blocks

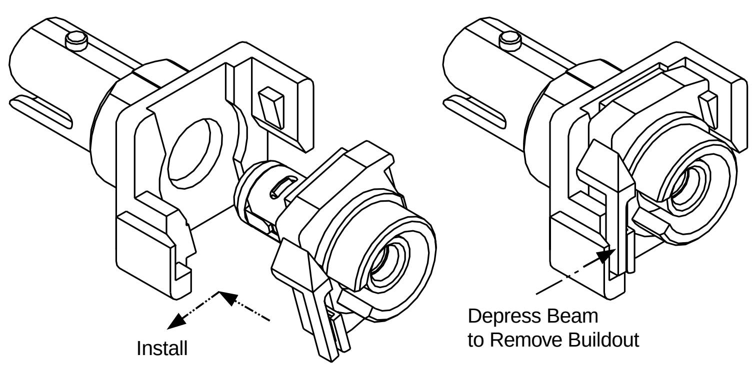
ST buildout and buildout block



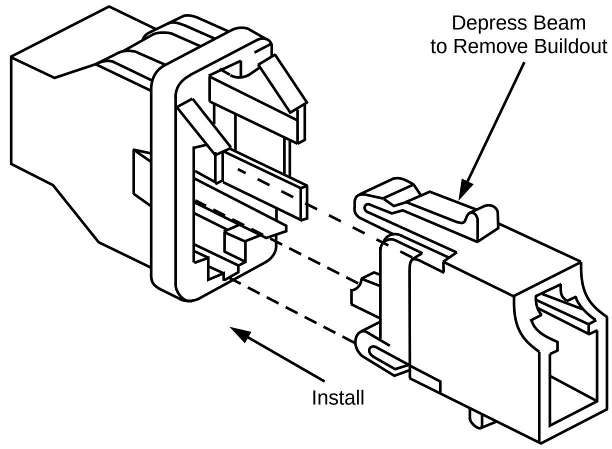
SC buildout and buildout block



FC buildout and buildout block



LC buildout and buildout block



☐

Task 708: Make a Manual Optical Loopback

Purpose

Use this procedure to loop back an **out-of-service** optical line at the faceplate connectors of the port unit.

Required equipment

The following equipment is required to perform this task:

- Wrist strap
- One lightguide jumper (package label FS1E-E-02) for each optical line to be looped back (*ST*®, SC, and FC type connections)
- One lightguide jumper (MS1A40LC-LC-2) for each optical line to be looped back (LC type connections)
- One 20-dB loss lightguide buildout (LBO) (code ASTM20 – part number 108053042 for ST connectors) (single mode –multimode) for each OC-3 or OC-12 line to be looped back
- One 20-dB loss lightguide buildout (LBO) (Part number 108279530 for LC connectors) (single mode –multimode) for each OC-3 line to be looped back
- One 20-dB loss lightguide buildout (LBO) (code ASTS20 – part number 108053273 for ST connectors) (single mode – single mode) for each OC-48 optical line to be looped back
- One 15-dB loss lightguide buildout (LBO) (code ASTS15 – part number 108053240 for ST connectors) (single mode – single mode) for each OC-192 optical line to be looped back
- One 15-dB loss lightguide buildout (LBO) (Part number 108358169 for LC connectors) (single mode – single mode) for each OC-192 optical line to be looped back

Safety precautions

To assure both personal safety and the proper functioning of the WaveStar TDM 2.5G/10G system, it is imperative to review and understand these warnings and precautions prior to performing this task.

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

Traffic and service interruption can occur to other optical lines if they are accidentally looped back. Recheck the address (AID) of the optical line being looped back.

CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar TDM 2.5G/10G system to prevent electrostatic discharge damage to sensitive components. See "Electrostatic Discharge (ESD) Considerations" in the Safety Appendix.

Related information

For related information in *WaveStar TDM 2.5G/10G User Operations Guide, 365-371-210*, see:

- *Chapter 3, Product Description*
- *Chapter 5, Circuit Pack/Port Unit Descriptions*

Task Complete the following steps to manually loop back an **out-of-service** optical line at the faceplate of a port unit.

1

IF the port unit is…	THEN obtain a…
LEY14 OC12/STM4/1.3SR2 LEY16 OC3/STM1/1.3SR4	lightguide jumper (package label FS1E-E-02). These port units are equipped with a 0-dB loss lightguide buildout (LBO). No attenuation is required.
LEY23 OC3/STM1/1.3SR8	lightguide jumper (MS1A40LC-LC-2). These port units are equipped with a 0-dB loss lightguide buildout (LBO). No attenuation is required.
LEY13 OC12/STM4/1.3LR2 LEY15 OC3/STM1/1.3LR4	lightguide jumper (package label FS1E-E-02) and a 20-dB LBO (code ASTM20 – part number 108053042 for ST connectors).
OC48/STM16/LR OC48/STM16/SR	lightguide jumper (package label FS1E-E-02) and a 20-dB loss LBO (code ASTS20 – part number 108053273 for ST connectors).
LEY182 OC48/STM16/ 1.3VSR1	lightguide jumper (package label FS1E-E-02). These port units are equipped with a 0-dB loss lightguide buildout (LBO). No attenuation is required.
OC192/STM64	lightguide jumper (package label FS1E-E-02) and a 15-dB loss LBO (code ASTS15 – part number 108053240 for ST connectors) or lightguide jumper (MS1A40LC-LC-2) and a 15-dB loss LBO (part number108358169 for LC connectors).

2 At the faceplate connectors of the port unit, remove the optical line connections. Make a record of these disconnections so they can be replaced after the test.

Reference: *SE 708-1: Remove Optical Line Connections*

3 Remove the LBO from the **IN** connector of the port unit (if equipped).

Reference: *Supporting Task 707, Install/Remove Lightguide Buildout*

4 Remove the protector caps from the ends of the lightguide jumper (loopback cable).

5 Clean the LBOs, fiber, and connectors.

Reference: *Supporting Task 703, Clean Optical Fibers and Connectors*

6

IF the port unit is…	THEN…
LEY14 OC12/STM4/1.3SR2 LEY16 OC3/STM1/1.3SR4 LEY23 OC3/STM1/1.3SR8	replace the 0-dB loss LBO (removed in Step 3) into the **IN** connector of the port unit. **Reference:** *Supporting Task 707, Install/Remove Lightguide Buildout*
LEY13 OC12/STM4/1.3LR2 LEY15 OC3/STM1/1.3LR4	install the 20-dB loss into the **IN** connector of the port unit. **Reference:** *Supporting Task 707, Install/Remove Lightguide Buildout*
OC48/STM16/SR OC48/STM16/LR	install the 20-dB loss into the **IN** connector of the port unit. **Reference:** *Supporting Task 707, Install/Remove Lightguide Buildout*
LEY1182 OC48/STM16/1.3VSR1	replace the 0-dB loss LBO (removed in Step 3) into the **IN** connector of the port unit. **Reference:** *Supporting Task 707, Install/Remove Lightguide Buildout*
OC192/STM64	install the 15-dB loss into the **IN** connector of the port unit. **Reference:** *Supporting Task 707, Install/Remove Lightguide Buildout*

7 Connect the lightguide jumper between the LBO on the **IN** connector and the corresponding **OUT** connector on the same port unit.

8 If required, repeat Step 2 through Step 7 to loop back another optical line.

END OF STEPS

SE 708-1: Remove the Optical Line Connections

Procedure

Complete the following steps to remove the optical line connections at the faceplate connectors of the port unit.

Important! A wrong connection can be avoided by marking or recording all disconnections.

1 Remove the optical line connection from the **OUT** connector of the port unit and slide the protector cap over the end of the fiber.

2 Remove the optical line connection from the **IN** connector of the port unit and slide the protector cap over the end of the fiber.

END OF STEPS

Task 709: Replace Fan Unit

Purpose

Perform this task *ONLY* when instructed to do so as part of a trouble-clearing task.

Required equipment

The following equipment is required to complete this procedure:

- Replacement fan unit
- WaveStar Craft Interface Terminal (CIT) that is connected to the subject network element (NE)
- Wrist strap

Safety precautions

To assure both your personal safety and the proper functioning of the WaveStar TDM 2.5G (OC-48)/10G (OC-192) (2-Fiber) product, it is imperative for you to review and understand these warnings and precautions prior to performing this task.

CAUTION

Never remove the fan unit unless you already have a replacement fan unit in hand and immediately perform the replacement, as instructed in this procedure. Leaving the fan unit out for more than 15 minutes can cause the associated network element to fail.

CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on an NE to prevent electrostatic discharge damage to sensitive components.

CAUTION

Leaving the fan unit out of the shelf for more than 15 minutes can cause the associated network element to fail. It is critical *that you complete this procedure — as well as the referencing trouble-clearing procedure — soon after performing this step.*

Related information For related information, see *Chapter 2, Maintenance/Trouble-Clearing* in this document.

Task Complete the following steps to replace a fan unit.

1 Physically locate the replacement fan unit near to and within easy reach of the subject NE/shelf.

2 If applicable, remove the front cover of the subject NE/shelf.

3 With your fingers, unscrew (turn counter-clockwise) the two captive type thumbscrews that are located on the front (one right and one left) of the fan unit.

4 Gently and by applying an even force to both the left and right sides, pull the fan unit forward with the center mounted handle in order to remove it from the shelf.

5 Carefully insert the replacement new fan unit into the shelf. Again, use the center-mounted handle to push the “self-aligning” fan unit into the shelf.

6 Tighten (turn clockwise) the two thumbscrews in order to secure the fan unit into the shelf.

7 Return to the trouble-clearing task that referred you to this task.

ND OF STEPS

☐

Task 711: Select Lightguide Buildout

Purpose

Use this procedure to select a lightguide buildout (LBO) based on the following:

- Type of port unit
- Measured received optical power (dBm) at the **IN** connector
- Type of optical connector

The lightguide buildouts are used to adjust the received optical power levels at the **IN** connector of the port unit. If connecting to a different system, refer to the appropriate procedure for that system.

> **Important!** All WaveStar TDM 2.5G/10G system port units require single-mode fiber.

Safety precautions

To assure both personal safety and the proper functioning of the WaveStar TDM 2.5G/10G system, it is imperative to review and understand these warnings and precautions prior to performing this task.

CAUTION

The LBO must be placed on the IN connector of the port unit faceplate to prevent equipment damage.

CAUTION

Do not substitute single-mode to single-mode (SM-SM) LBOs for single-mode to multimode (SM-MM) LBOs. Substituting SM-SM LBOs for SM-MM LBOs could cause transmission errors and/or equipment damage.

Related information For related information see the following:

- *Supporting Task 707, Install/Remove Lightguide Buildout*
- *Supporting Task 712 Measure Received Optical Power*

For related information in the *WaveStar TDM 2.5G/10G User Operations Guide*, *365-371-210*, see *Chapter 5, Circuit Pack/Port Unit Descriptions*.

Before you begin Before you begin this task:

- Verify the type of port unit used.
- Obtain the received optical power measurement for the port unit using an optical power meter (for example, the HP8140A equipped with HP81401A ITE#6550 or equivalent). (Refer to *Supporting Task 712 Measure Received Optical Power*.)
- Verify the type of optical connector (*ST*®, FC, or SC) used.

Task Complete the following steps to select an LBO based on the type of port unit, received optical power, and type of optical connector.

1

IF ...	THEN go to ...
OC3/STM1 port unit,	Step 2.
OC12/STM4 port unit,	Step 2 .
OC48/STM16 port unit,	Step 4.
OC192/STM64 port unit,	Step 6.

2 Based on the measured received optical power at the **IN** connector of the OC3/STM1 or OC12/STM4 port unit, determine the LBO value that is required.

> **Reference:** *SE 711-1: LBO Values for OC3/STM1 and OC12/STM4 Port Units*

3 Based on the required optical connection (ST, FC, SC, or LC), and the LBO value (determined in Step 2), select the required LBO.

Reference: *SE 711-2: Single-Mode to Multimode (SS-MM) LBOs*

Stop! End of Task.

4 Based on the measured received optical power at the **IN** connector of the OC48/STM16 port unit, determine the LBO value that is required.

Reference: *SE 711-3: LBO Values for OC48/STM16 Port Units*

5 Based on the required optical connection (ST, FC, or SC) and the LBO value (determined in Step 4), select the required LBO.

Reference: *SE 711-4: Single-Mode to Single-Mode (SM-SM) LBOs*

Stop! End of Task.

6 Based on the measured received optical power at the **IN** connector of the OC192/STM64 port unit, determine the LBO value that is required.

Reference: *SE 711-5: LBO Values for OC192/STM64 Port Units*

7 Based on the required optical connection (ST, FC, SC, or LC) and the LBO value (determined in Step 6), select the required LBO.

Reference: *SE 711-4: Single-Mode to Single-Mode (SM-SM) LBOs*

END OF STEPS

□

SE 711-1: LBO Values for OC3/STM1 and OC12/STM4 Port Units

Received optical power and LBO values for OC3/STM1 and OC12/STM4 port units

The following table shows the port units, measured received optical power range, and the recommended LBO value.

Port unit	Measured received optical power (dBM)	Recommended LBO value (dB)
LEY13 OC12/STM4/1.3LR2	0.0 to –4.9	15
	–5.0 to –9.9	10
	–10.0 to –14.9	5
	–15.0 and lower	0
LEY14 OC12/STM4/1.3SR2	2.0 to –2.9	15[1]
	–3.0 to –7.9	10[1]
	–8.0 and lower	0
LEY15 OC3/STM1/1.3LR4	0.0 to –4.9	15
	–5.0 to –9.9	10
	–10.0 to –14.9	5
	–15.0 and lower	0
LEY16 OC3/STM1/1.3SR4	0.0 to –3.9	15[1]
	–4.0 to –7.9	10[1]
	–8.0 and lower	0
LEY23 OC3/STM1/1.3SR8	0.0 to –3.9	15[1]
	–4.0 to –7.9	10[1]
	–8.0 and lower	0

Notes:

1. Used only when the opposite end of the optical span is equipped with a long-reach port unit.

☐

SE 711-2: Single-Mode to Multimode (SM-MM) LBOs

SM-MM LBOs The following table shows the SM-MM LBOs.

Type of optical connection	LBO value (dB)	Product code	Comcode	Color
ST	0	A3070	106 795 354	White or Blue
	5	ASTM5	108 052 960	Gray or Beige
	10	ASTM10	108 052 994	Gray or Beige
	15	ASTM15	108 053 018	Gray or Beige
	20	ASTM20	108 053 042	Gray or Beige
FC	0	A3080	106 795 404	White or Blue
	5	AFCM5	108 107 285	Gray or Beige
	10	AFCM10	108 107 301	Gray or Beige
	15	AFCM15	108 107 327	Gray or Beige
	20	AFCM20	108 107 343	Gray or Beige
SC	0	A3060	106 708 951	White or Blue
	5	ASCM5	108 440 579	Gray or Beige
	10	ASCM10	108 440 595	Gray or Beige
	15	ASCM15	108 440 611	Gray or Beige
	20	ASCM20	108 440 637	Gray or Beige
LC	5	-	108 279 381	-
	10	-	108 279 431	-
	15	-	108 279 480	-
	20	-	108 279 530	-

☐

SE 711-3: LBO Values for OC48/STM16 Port Units

Receive optical power and LBO values for OC48/STM16 port units

The following table shows the measured received optical power ranges and the recommended LBO values for OC48/STM16 port units.

Port Unit	Measured received optical power (dBM)	Recommended LBO value (dB)
LEY7 OC48/STM16/1.3LR1 LEY8 OC48/STM16/1.5LR1 LEY50-LEY65 OC48/STM16/DWDM1-16 LEY101-LEY180 OC48/STM16/WDM LEY80-LEY95 OC48/STM16/POU	0.0 to –4.9	15
	–5.0 to –9.9	10
	–10.0 to –14.9	5
	–15.0 and lower	0
LEY182 OC48/STM16/1.3VSR1	–1.0 and lower	0

□

SE 711-4: Single-Mode to Single-Mode (SM-SM) LBOs

ST-type SM-SM LBOs

The following table shows the ST-type SM-SM LBOs. These LBOs are available in the ST-type LBO Kit J68974E-1, List 116.

LBO value (dB)	Product code	Comcode	Color
0	A3070	106 795 354	White
5	A3070B	106 795 362	Yellow
	A3070B1	107 406 183	Yellow
	ASTS5	108 053 091	Green
10	A3070D	106 795 370	Yellow
	A3070D1	107 406 191	Yellow
	ASTS10	108 053 190	Green
15	A3070F	106 795 388	Yellow
	A3070F1	107 406 209	Yellow
	ASTS15	108 053 240	Green
20	A3070H	106 795 396	Yellow
	A3070H1	107 406 217	Yellow
	ASTS20	108 053 273	Green

FC-type SM-SM LBOs

The following table shows the FC-type SM-SM LBOs. These LBOs are available in the FC-type LBO Kit J68974E-1, List 126.

LBO value (dB)	Product code	Comcode	Color
0	A3080	106 795 404	White
5	A3080B	106 795 412	Yellow
	A3080B1	107 406 225	Yellow
	AFCS5	108 107 095	Green
10	A3080D	106 795 420	Yellow
	A3080D1	107 406 233	Yellow
	AFCS10	108 107 194	Green
15	A3080F	106 795 438	Yellow
	A3080F1	107 406 241	Yellow
	AFCS15	108 107 244	Green
20	A3080H	106 795 446	Yellow
	A3080H1	107 406 258	Yellow
	AFCS20	108 107 277	Green

SC-type SM-SM LBOs

The following table shows the SC-type SM-SM LBOs. These LBOs are available in the SC-type LBO Kit J68974E-1, List 136.

Loss value (dB)	Product code	Comcode	Color
0	A3060	106 708 951	Blue
5	A3060B	106 708 969	Yellow
	A3060B1	107 406 142	Yellow
	ASCS5	108 440 501	Green
10	A3060D	106 708 977	Yellow
	A3060D1	107 406 159	Yellow
	ASCS10	108 440 600	Green
15	A3060F	106 708 985	Yellow
	A3060F1	107 406 167	Yellow
	ASCS15	108 440 538	Green
20	A3060H	106 708 993	Yellow
	A3060H1	107 406 175	Yellow
	ASCS20	108 440 561	Green

LC-type SM-SM LBOs

The following table shows the LC-type SM-SM LBOs.

LBO value (dB)	Product code	Comcode	Color
5	-	108 288 473	-
10	-	108 288 457	-
15	-	108 358 169	-
20	-	108 358 219	-

□

SE 711-5: LBO Values for OC192/STM64 Port Units

Receive optical power and LBO values for OC192/ STM64 port units

The following table shows the measured received optical power range and the recommended LBO value.

Port unit	Measured receive optical power (dBm)	Recommended LBO value (dB)
LEY67 OC192/STM64/1.5SR1 LEY69 OC192/STM64/1.5IR1 LEY284-LEY299 OC192/STM64/POU LEY384-LEY399 OC192/STM64/POU	0.0 to –3.9	15
	–4.0 to –8.9	10
	–9.0 to –13.9	5
	–14.0 and lower	0
LEY97 OC192/STM64/1.5IRS1	0.0 to –1.9	10
	–2.0 to –5.9	5
	–6.0 and lower	0

□

Task 712: Measure Received Optical Power

Purpose

Use this procedure to connect an optical power meter and measure the received optical power at the **IN** connector of a port unit.

Required equipment

The following equipment is required to perform this task:

- Wrist strap
- Optical power meter with appropriate connectors; for example, the HP8140A equipped with HP81401A (ITE#6550) or equivalent

Safety precautions

To assure both personal safety and the proper functioning of the WaveStar TDM 2.5G/10G system, it is imperative to review and understand these warnings and precautions prior to performing this task.

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 TDM 2.5G/10G system to prevent electrostatic discharge damage to sensitive components. See "Electrostatic Discharge (ESD) Considerations" in the Safety Appendix.

Related information

For related information in this document, see the following sections:

- *Supporting Task 711, Select Lightguide Buildout*
- *Supporting Task 707, Install/Remove Lightguide Buildout*

For related information in 365-371-210, *WaveStar TDM 2.5G/10G User Operations Guide*, see *Chapter 5, Circuit Pack/Port Unit Descriptions*.

Before you begin

Before you begin this task:

- Verify the type of port unit used.
- Verify the location of the port unit and **IN** connector.

Task

Complete the following steps to connect an optical power meter and measure the received optical power at the **IN** connector of a port unit.

1 Remove the optical fiber from the **IN** connector of the port unit faceplate.

Important! Ensure that the optical power meter is set for the wavelength being measured (for example, 1310 nm or 1550 nm).

2 Connect the optical power meter to the optical fiber removed in Step 1, and obtain an optical power measurement. (Record the measurement for office records.)

3 Using the optical power measurement obtained in Step 2, determine if the optical power level is correct.

Reference: *SE 712-1: Received Optical Power*

4

IF the optical power level is…	THEN…
correct (in range),	**STOP! End of Task.**
not correct (optical loss out of range),	check the upstream port unit and outside plant fiber.

ND OF STEPS

SE 712-1: Received Optical Power

Port units and correct (in range) received optical power levels

The following table shows ports units and the correct (in range) received optical power levels.

Port unit	Maximum Received Power (PRmax) (dBm)	Receiver Sensitivity (PRmin) (dBm)	Recommended Minimum Receive Power Level at Installation (dBm)
LEY13 OC12/STM4/1.3LR2	–8.0	–30.5	–25.0
LEY14 OC12/STM4/1.3SR2	–8.0	–28.0	–27.0
LEY15 OC3/STM1/1.3LR4	–10.0	–34.0	–29.0
LEY16 OC3/STM1/1.3SR4	–8.0	–28.0	–27.0
LEY23 OC3/STM1/1.3SR8	–8.0	–28.0	–27.0
LEY7 OC48/STM16/1.3LR1	–9.0	–27.0	–21.5
LEY8 OC48/STM16/1.5LR1	–9.0	–28.0	–21.5
LEY50–LEY65 OC48/STM16/DWDMxx	Refer to 365-575-558, Metropolis metroEON Enhanced Optical Networking, Applications and Planning Guide.		
LEY80–LEY95 OC48/STM16/POUxxxx	–9.0	–28.0	–21.5
LEY101–LEY180 OC48/STM16/WDMxxxx	Refer to 365-575-759, WaveStar Optical Line System (OLS) 1.6T Applications Planning Guide.		
LEY182 OC48/STM16/1.3VSR1	–1.0	–14.0	–7.0
LEY67 OC192/STM64/1.5SR1	–13.0	–21.0	–17.0
LEY69 OC192/STM64/1.5SR1	–8.0	–21.0	–17.0
LEY97 OC192/STM64/1.5IRS1	–3.0	–14.0	–10.0
LEY201–LEY240 OC192/STM64/WDMxxxx	Refer to 365-575-759, WaveStar Optical Line System (OLS) 1.6T Applications Planning Guide.		
LEY284–LEY299 OC192/STM64/POUxxxx	–8.0	–21.0	–17.0
LEY384–LEY399 OC192/STM64/POUxxxx	–8.0	–21.0	–17.0
LEY309AE GE1/SX2	0	–17.0	–10.0
LEY310AE GE1/LX2	–3.0	–20.0	–16.0

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Lucent Technologies
Bell Labs Innovations

Appendix A: Safety

Overview

Purpose This chapter provides important safety instructions for the WaveStar® TDM 2.5G/10G Alarm Messages and Trouble Clearing Guide.

Contents This chapter contains the following sections:

□

General notes on safety

Overview

Purpose

This chapter on safety *must* be read by the responsible technical personnel before carrying out relevant work on the system. The valid version of this document must always be kept close to the equipment.

Not only must the general instructions in this chapter on safety be observed, but also the specific safety instructions in the individual chapters.

All safety instructions have a uniform appearance. Please refer to Structures of safety instructions.

The equipment has been developed in line with the present state-of-the-art and fulfils the current national and international safety requirements. It is provided with a high degree of operational safety resulting from many years of development experience and continuous stringent quality checks in our company.

The equipment is safe in normal operation. There are, however, some potential sources of danger that cannot be completely eliminated. In particular, these arise during the

- opening of housings or equipment covers,
- manipulation of any kind within the equipment, even if it has been disconnected from the power supply,
- disconnection of optical or electrical connections, through possible contact with:
  - live parts,
  - laser light,
  - hot surfaces,
  - sharp edges, or
  - components sensitive to electrostatic discharge.

Structure of safety instructions

All safety instructions include a *warning symbol* and a *signal word* that classify the danger and a *text block* that contains descriptions of the type and cause of the danger, the consequences of ignoring the safety instruction and the measures that can be taken to minimize the danger.

Example:

DANGER

Arcing on removing or inserting a live power supply plug.

Arcing can cause serious burns to the hands and damage to the eyes.

Ensure that the line circuit-breaker on the Rack Connection Panel (RCP) is in the "OFF" position before removing or inserting the power supply plug.

Danger classification

There are three classes of safety instructions: *Danger*, *Warning* and *Caution*; which class is relevant depends on the consequences of ignoring the safety instruction:

DANGER	Serious injury is definite or likely.
WARNING	Serious injury is possible.
CAUTION	Minor injury is definite, likely or possible, or material damage to the product or in the product environment is definite or likely.

Special safety instructions

The aspects of *laser safety* and *handling of components sensitive to electrostatic discharge (ESD)* are of vital importance for the equipment. Therefore, the key safety instructions for these subjects are summarized in the sections: Lasser safety and Electrostatic discharge.

General safety requirements

In order to keep the technically unavoidable residual risk to a minimum, it is imperative to observe the following rules.

- Transport, storage and operation of the unit/system must be under the *permissible conditions only*

  See accompanying documentation and information on the unit/ system.

- Installation, configuration and disassembly must be carried out only by expert personnel and with reference to the respective documentation.

  Due to the complexity of the unit/system, the personnel requires special training.

- The unit/system must be operated by *expert and authorized users only*.

  The user must operate the unit/system only after having *read and understood* the chapter on safety and the parts of the documentation relevant to operation. For complex systems, additional training is recommended. Any obligatory training for operating and service personnel must be carried out and documented.

- The unit/system must not be operated unless it is in perfect working order.

  Any faults and errors that might affect safety must be reported *immediately* by the user to a person in responsibility.

- The unit/system must be operated only with the connections and under the environmental conditions as described in the documentation.

- Any conversions or changes to the system or parts of the system (including the software) must be carried out by qualified Lucent Technologies personnel or by expert personnel authorized by Lucent Technologies.

  All changes carried out by other persons lead to a *complete exemption from liability*.

  No components/spare parts must be used other than those recommended by the manufacturer and those listed in the procurement documents.

- The removal or disabling of safety facilities, the clearing of faults and errors, and the maintenance of the equipment must be carried out by *specially qualified personnel only*.

  The respective parts of the documentation must be strictly observed. The documentation must also be consulted during the selection of measuring and test equipment.
- Calibrations, special tests after repairs and regular safety checks must be carried out, documented and archived.
- Non-system software is used at one's *own risk.* The use/ installation of non-system software can adversely affect the normal functioning of the unit/system.
- Only use *tested and virus-free* floppy disks and streamer tapes.

□

Laser safety

System design

The Lucent Technologies system complies with FDA/CDRH 21 CFR 1040.10 and 1040.11 as a Class I and with IEC 60825-1 as a Class 1 Optical Fiber Telecommunication laser product. The system has been designed to ensure that the operating personnel is not endangered by laser radiation during normal system operation. The safety measures specified in the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) regulations and the international standards IEC-60825 or DIN/EN 60825 are met. Please also refer to Laser product classification (A-9),

Potential sources of danger

Beware of the following potential sources of danger which will remain despite all safety measures taken

- Laser radiation can cause damage to the skin and eyes.
- Laser radiation from optical transmission systems is in a wavelength range that is invisible to the human eye.

Laser classes

The maximum output power of laser radiation depends on the type of laser diode used. The international standards IEC-60825 or DIN/EN 60825 define the maximum output power of laser radiation for each laser class.

Laser class	Wavelength	Maximum output power of laser radiation
1	1310 nm	8.85 mW
	1550 nm	10 mW
3A	1310 nm	24 mW
	1550 nm	50 mW
3B	1310 nm	0.5 W
	1550 nm	0.5 W

Laser warning labels

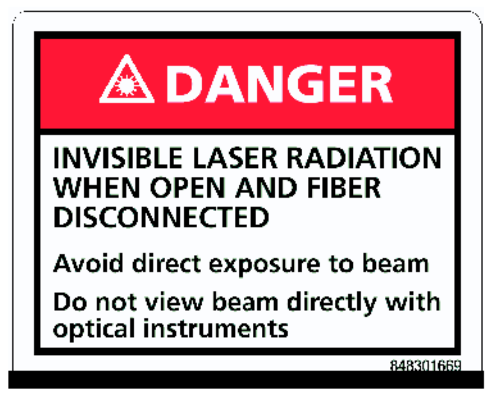
The laser warning labels indicate either only the laser class or both the laser class and the maximum output power of laser radiation.

The following figure shows different types of laser Warning labels and their characteristics.

1

2

3



Legend

Legend to the different types of laser warning labels.

1. Laser warning symbol.
2. This laser warning label is mounted on the front cover outside it. It always refers to normal operation.
3. This laser warning label is affixed inside the subrack.

Laser safety instructions

Observe the following instructions to avoid exposing yourself and others to risk.

- Read the relevant descriptions in the manuals before taking equipment into operation or carrying out any installation and maintenance work on the optical port units, and follow the instructions. Ignoring the instructions can result in exposure to dangerous radiation.
- Do not view directly into the laser beam with optical instruments such as a fiber microscope, because viewing of laser emission in excess of Class 1 limits significantly increases the risk of eye damage.
- Never look into the end of an exposed fiber or an open connector as long as the optical source is still switched on.
- Ensure that the optical source is switched off before disconnecting optical fiber connectors.
- In the event of doubt, check that the optical source is switched off by measuring with an optical power meter.

□

Laser product classification

Standards compliance

The product complies with both IEC standards and the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) regulations.

FDA/CDRH regulations

Laser products are classified in accordance with the FDA/CDRH - 21 CFR 1010 and 1040. The classification scheme is based on the ability of the laser emission to cause injury to eye or skin during normal operating conditions

In the United States, lasers and laser systems in the infrared wavelength range (greater than 700 nm) are assigned to one of the following classes:

- Class I,
- Class IIIb, or
- Class IV.

Laser classification is dependent upon operating wavelength, output power and fiber mode field diameter (core diameter).

IEC requirements

The International Electro-Technical Commission (IEC) establishes standards for the electrical and electronic industries. IEC-60825 has been established for the worldwide safety of laser products.

According to the IEC classification, lasers and laser systems in the infrared wavelength range (greater than 700 nm) are assigned to one of the following classes:

According to the IEC classification, lasers and laser systems in the infrared wavelength range (greater than 700 nm) are assigned to one of the following classes:

- Class 1,
- Class 3A,
- Class 3B, or
- Class 4.

There are some major differences between the FDA/CDRJ regulations and IEC.

1. The Accessible Emission Limits (AEL) are different.
2. Class 3A applies to all wavelengths.
3. Class 3B requires strict engineering controls.
4. Classification is under single fault conditions.

Hazard level assignment

Hazard level refers to the potential hazard from laser emission 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. The assignment of hazard level uses the AELs for the classes.

Hazard levels for optical transmission equipment are assigned in either of the following two ways:

- actual output power from the connector or fiber cut.
- if automatic power reduction is used, output power at the connector or fiber cut at one second after automatic power reduction takes place provided that maximum output and restart conditions are met.

These are covered by a front panel to ensure protection against emissions from any energized, unterminated transmitter.

The circuit packs themselves, however, may be IEC Class 1 or 3A or FDA/CDRH Class I or IIIb

□

Electrostatic discharge

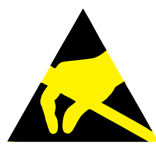
Overview

Electrostatic discharge (ESD) (for example, caused by touching with the hand) can destroy semiconductor components. The correct operation of the complete system is then no longer assured

All semiconductor components are basically sensitive to electrostatic discharge. The electrostatic discharge can also affect the components indirectly using contacts or conductor tracks.

Barred-hand symbol

Circuit packs containing components that are especially sensitive to electrostatic discharge are identified by warning labels bearing the barred-hand symbol.



ESD instructions

Observe the following ESD instructions to avoid damage to electrostatic-sensitive components:

- Wear working garment made of 100% cotton to avoid electrostatic discharge.
- Touch the circuit packs at the edges or the insertion and removal facilities only.
- Ensure that the rack is grounded.
- Wear conductively connected wrist straps and connect them to the rack ESP bonding point.
- Work in an area which is protected against electrostatic discharge. Use conducting floor and bench mats which are conductively connected to the rack ESP bonding point.
- Conductively connect all test equipment and trolleys to the rack ESP bonding point.
- Store and ship circuit packs and components in their shipping packing. Circuit packs and components must be packed and unpacked only at workplaces suitably protected against build-up of charge.

□

Important safety instructions forWaveStar® TDM 2.5G/10G systems

Instructions

Especially observe the following safety instructions, they are of particular importance for WaveStar® TDM 2.5G/10G systems:

Invisible laser radiation

DANGER

Injury to eyes caused by invisible laser radiation.

WaveStar TDM 2.5G/10G (2-Fiber) systems operate with invisible laser radiation. Laser radiation can cause considerable injuries to the eyes.

Never look into the end of an exposed fiber or plug-in optical connectors as long as the optical source is switched on. Always observe the laser warning instructions.

Power supply plug

DANGER

Arcing on removing or inserting a live power supply

Arcing can cause serious burns to the hands and damage to the eyes.

Ensure that the line circuit-breaker on the Rack Connection Panel (RCP) is in the "OFF" position before removing or inserting the power supply plug.

Shielded 10BaseT LAN cables

DANGER

Risk of electrical shock and/or serious injury

There is a risk of electrical shock and/or serious injury if shielded 10BaseT LAN cables are used, and the applicable national safety requirements have not been met

The usage of shielded 10BaseT LAN cables is only allowed if the applicable national safety requirements have been met by the user. Otherwise, there is a risk of electrical shock and/or serious injury.

Electrostatic discharge (ESD)

CAUTION

Destruction of components by electrostatic

Electronic components can be destroyed by electrostatic discharge.

Plug-in units must therefore always be kept in antistatic covers. Use the original packaging if possible. Always observe the ESD instructions.

This page is intentionally blank.

READ AND UNDERSTAND ALL INSTRUCTIONS

The exclamation*!* point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying this product.

When installing, operating, or maintaining this equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following

1. Follow all warnings and instructions marked on this product
2. This equipment is to be installed only in Restricted Access Areas
3. To be powered only by Safety Extra Low Voltage (SELV) -48 V dc Sources.
4. Disconnect up to Two (2) power supply connections when removing power from the system.
5. This product should be only operated from the type of power sources indicated on the marking label.
6. Connect this product only to the type of power sources recommended by Lucent Technologies. For information on the powering instructions, consult the Installation Instructions section of the Installation Manual.
7. This equipment must be provided with a readily accessible disconnect device as part of the building installation.
8. Installation must include an independent frame ground drop to the building ground.
9. For information on proper mounting instructions, consult the Instructions section of the Installation Manual.
10. Install only equipment identified in the Installation Manual. Use of other equipment may result in improper connection of circuitry leading to fire or injury to persons.
11. The telecommunication interfaces should not leave the building premises unless connected to telecommunication devices providing primary and secondary protection, as possible.
12. Do not use this product near water, for example, in a wet basement.
13. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
14. Use caution when installing or modifying telecommunications lines.
15. Never install telecommunications wiring during a lightning storm.

16. Never install telecommunications connections in wet locations.
17. Never touch uninsulated telecommunications wires or terminals unless the telecommunications line has been disconnected at the network interface.
18. Never touch uninsulated wiring or terminals carrying direct current or ringing current, or leave this wiring exposed. Protect and tape uninsulated wiring and terminals to avoid risk of fire, electric shock, and injury to service personnel.
19. 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 liquids of any kink on the product.
20. Slots and openings in the unit are provided for ventilations, to protect it from overheating, and these openings must not be blocked or covered. This product should not be placed in a built-in installation unless proper ventilation is provided.
21. To reduce the risk of an electrical shock, do not disassemble this product. Service should be performed by trained personnel only. Opening or removing covers and/or circuit packs may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electrical shock when the unit is subsequently used.
22. Some of the WaveStar TDM 2.5G (OC-48)/10G (OC-192) (2-Fiber) system circuit packs contain FDA/CDRH Class I/IEC Class 1 single-mode laser products that are enclosed lightwave transmission systems. Under normal operating conditions, lightwave transmission systems are completely enclosed; nonetheless, the following precaution must be observed because of the potential for eye damage:
    - Do not disconnect any lightwave cable or splice and stare into the optical connectors terminating the cables.
    - Lightwave/lightguide operations should not be performed by a technician who has not satisfactorily completed an approved training course.
    - Do not use optical instruments such as an eye loupe to view a fiber or unterminated connector.
    - More information about laser safety can be found in the Installation

SAVE THESE INSTRUCTIONS!

Abbreviations and Acronyms

Numerics

5ESS®
Number 5 Electronic Switching System

A

ABN
Abnormal (condition)

ABS
Absent

AC
Alternating Current

ACO
Alarm Cut-Off

ACT
Active

ACU
Alarm Collection Unit (RR)

ADJCTL/DCC
Adjunct Control/32 Data Communication Channels circuit pack

ADJCTL/DCCEI
Adjunct Control/32 Data Communication Channels with External Interface circuit pack

ADM
Add/Drop Multiplexer

ADR
Add/Drop Ring

AGNE
Alarm Gateway Network Element

AID
Access Identifier

AIS
Alarm Indication Signal

AITS
Acknowledged Information Transfer Service: Confirmed mode of operation of the LAPD protocol.

ALS
Automatic Laser Shutdown

AMI
Alternate Mark Inversion

ANSI
American National Standards Institute

APD
Avalanche PhotoDiode

APS
Automatic Protection Switch

ASAP
Alarm Severity Assignment Profile

AS&C
Alarm, Status, and Control

APD
Avalanche PhotoDiode

APSD
Automatic Power Shutdown

ARM
Adaptive Receiver Module

AS
Alarm Suppression assembly

ASCII
American Standard Code for Information Interchange

ASN.1
Abstract Syntax Notation 1

ATC
Auxiliary Transmission Channel

ATM
Asynchronous Transfer Mode

ATPC
Automatic Transmit Power Control

AU
Administrative Unit

AU PTR
Administrative Unit Pointer

AU4AD
Administrative Unit 4 Assembler/Disassembler

AUG
Administrative Unit Group

AUTO
Automatic

AVAIL
Available

B **B3ZS**
Bipolar 3-Zero Substitution

B8ZS
Bipolar 8-Zero Substitution

BBTR
Backplane Bus Transceiver

BCLAN
Board Controller Local Area Network

BDFB
Battery Distribution and Fuse Bay

BER
Bit Error Rate

BIN
Binary

BIP-N
Bit Interleaved Parity-N

BISDN
Broadband Integrated Services Digital Network

BITS
Building Integrated Timing Source (clock)

BITS
Building Integrated Timing Supply

BLK
Blank

BLSR
Bidirectional Line-Switched Ring

BOC
Bell Operating Company

BSW
Byte Switch circuit pack

BUSTR
BUS Transmitter and Receiver

C

C
Container

CAS
Channel Associated Signalling

CAT
Catastrophic

CC
Cross-Connection

CCITT
Comité Consultatif International Télégrafique & Téléphonique

CCS
Common Channel Signaling

CDRH
Center for Devices and Radiological Health

CEPT
Conférence Européenne des Administrations des Postes et des Télécommunications

CILINK
Communication Interface Link

CIT
Craft Interface Terminal

CL
Clear

CLEI
Common Language Equipment Identifier

CLLI
Common Language Location Identifier

CM
Configuration Management

CMI
Coded Mark Inversion

CMIP
Common Management Information Protocol. OSI standard protocol for OAM&P information exchange.

CMISE
Common Management Information Service Element

CO
Central Office

CP
Circuit Pack

CPE
Customer Premises Equipment

CR
Critical (alarm)

CRC
Cyclical Redundancy Check

CSIEX
Controlled System Interface Expander circuit pack

CSMA/CD
Carrier Sense Multiple Access with Collision Detection

CS&O
Lucent Technologies Customer Support and Operations

CSU
Channel Service Unit

CTIP
Customer Training and Information Products

CTL
Control (circuit pack prefix)

CTL/EI
Control/External Interface circuit pack

CTL/MEM
Control/Memory circuit pack

CTL/SR50DC
Sub-Rack Duplex (MCA 50D) circuit pack

CTL/SYS50D
System Controller Duplex (MCA 50D) circuit pack

CTL/SYS50DM
System Controller Duplex (MCA 50D) with Non-Volatile Memory circuit pack

CTLI-D
Control Interface to Device

CTS
Customer Technical Support within Lucent Technologies

CV
Coding Violation

CW
Continuous Wave (laser)

D **DACS**
Digital Access Cross-Connect System

dB
Decibels

DC
Direct Current

DCC
Data Communications Channel

DCE
Data Communications Equipment

DCN
Data Communications Network

DCS
Digital Cross-Connect System

DDF
Digital Distribution Frame

DIL
Dual In Line

DPLL
Digital Phase Locked Loop

DP-RING
Dedicated Protection Ring

DR
Digital Radio

DRI
Dual Ring Interworking

DRAM
Dynamic Random Access Memory

DS0, DS1, DS3
Digital Signal Levels 0, 1, 3

DS3EC1/8
8-port DS3 or EC-1 interface port unit

DS-N
Digital Signal, Level N

DS-NE
Directory Service Network Element

DSX
Digital Cross-Connect Frame

DTE
Data Terminating Equipment

DTMF
Dual Tone Multifrequency

DUS
Do not Use for Synchronization

DWDM
Dense Wavelength Division Multiplexing

E

EBER
Equivalent Bit Error Rate

EC
Echo Canceller

EC-1, EC-N
Electrical Carrier, Levels 1 and N

ECC
Embedded Control Channel

ECI
Equipment Catalog Item

EEPROM
Electrically Erasable Programmable Read-Only Memory

EF
Equipment Fail

EIA
Electronic Industries Association

EM
Event Management

EMC
Electromagnetic Compatibility

EMI
Electromagnetic Interference

EMS
Element Management System

EPROM
Erasable Programmable Read-Only Memory

EQ
Equipped

EQPT
Equipment

ES
Errored Seconds

ES
End System

ESD
Electrostatic Discharge

ESF
Extended Super Frame (DS1 signal format)

ETSI
European Telecommunications Standards Institute

EVT
Event

F **FCC**
Federal Communications Commission

FDA
Food and Drug Administration

FDDI
Fiber Distributed Data Interface

FE
Far End

FEBE
Far End Block Error

FEC
Forward Error Correction

FEPROM
Flash EPROM

FIT
Failure in Time

FTAM
File Transfer and Access Management

G **GB**
Gigabytes

Gb/s
Gigabits per second

GHz
Gigahertz

GNE
Gateway Network Element

GR
Geographic Redundancy

GR-XXX
Telcordia (Bellcore) General Requirement-XXX

H **HDB3**
High Density Bipolar 3

HDLC
High-Level Data Link Control

HE
Host Exchange

HMI
Human Machine Interface

HO
High Order

HPA
Higher Order Path Adaptation

HPC
Higher Order Path Connection

HPT
Higher Order Path Termination

HP-UX
Unix Operating System for Hewlett Packard platform

HS
High Speed

HW
Hardware

Hz
Hertz

I

IAO LAN
Intraoffice Local Area Network

ID
Identifier

IEC
International Electrotechnical Commission

IEEE
Institute of Electrical and Electronics Engineers

I/O
Input/Output

IMF
Infant Mortality Factor

INTFC
Interface

IR
Intermediate Reach

IS
In Service

ISDN
Integrated Services Digital Network

ISM
Intelligent Synchronous Multiplexer

ITCO
Independent Telephone Company

ITM
Integrated Transport Management

ITM-NM
Integrated Transport Management Network Module

ITM-SC
Integrated Transport Management Subnetwork Controller

ITU
International Telecommunications Union

ITU-R
International Telecommunications Union — Radio standardization sector. Formerly known as CCIR: Comité Consultatif International Radio; International Radio Consultative Committee.

ITU-T
International Telecommunications Union — Telecommunication standardization sector. Formerly known as CCITT: Comité Consultatif International Télégrafique & Téléphonique; International Telegraph and Telephone Consultative Committee.

IXC
Interexchange Carrier

K **Kb/s**
Kilobits per second

L **LAN**
Local Area Network

LATA
Local Access and Transport Area

LBC
Laser Bias Current

LBFC
Laser Backface Currents

LBO
Lightguide Build-Out

LCN
Local Communications Network

LCT
Large Capacity Terminal

LEC
Local Exchange Carrier

LED
Light-Emitting Diode

LEN
Local Exchange Node

LGX
Lightguide Cross-Connect

LH
Long Haul

LO
Low Order

LOF
Loss of Frame

LOM
Loss Of Multiframe

LOP
Loss of Pointer

LOS
Loss of Signal

LPA
Lower order Path Adaptation

LPBK
Loopback

LPC
Lower Order Path Connection

LPT
Lower Order Path Termination

LR
Long Reach

LS
Low Speed

LTE
Line Terminating Equipment

M **m**
Microns

mm
Micrometer

MB
Megabytes

Mb/s
Megabits per second

MCOND
Maintenance Condition

MEM
Memory

MIPS
Millions of Instructions Per Second

MJ
Major (alarm)

MMI
Man-Machine Interface

MML
Human-Machine Language

MN
Minor (alarm)

MS
Multiplex Section

ms
Millisecond

MS-SPRing
Multiplex Section Shared Protection Ring

MSOH
Multiplex Section OverHead

MTBF
Mean Time Between Failures

MTBMA
Mean Time Between Maintenance Activities

MTIE
Maximum Time Interval Error

MTPI
Multiplexer Timing Physical Interface

MTS
Multiplex Timing Source

MTTR
Mean Time To Repair

N **NA**
Not Applicable

NARTAC
North American Regional Technical Assistance Center

NCC
Network Communication Controller

NE
Network Element

NEBS
Network Equipment-Building System

NEE
Network Element Equivalent

NEF
Network Element Function

NEM
Network Element Manager

nm
Nanometer (10-9 meters)

NMA
Network Monitoring and Analysis System

NMON
Not Monitored

NMS
Network Management System

NNE
Non-SDH Network Element

NORM
Normal

NPI
Null Pointer Indication

NPPA
Non-Preemptible Protection Access

NRZ
Nonreturn to Zero

NSA
Non-Service Affecting

NSAP Address
Network Service Access Point Address (used in the OSI network layer 3)

NTF
No Trouble Found

NVM
Non-Volatile Memory

O

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

OC-1
Optical Carrier, Level 1 Signal (51.84 Mb/s)

OC-3
Optical Carrier, Level 3 Signal (155.52 Mb/s)

OC-3c
Optical Carrier, Level 3 Concatenated Signal (155.52 Mb/s)

OC-12
Optical Carrier, Level 12 Signal (622.08 Mb/s)

OC-48
Optical Carrier, Level 48 (2488.32 Mb/s) (2.5 Gb/s)

OC-192
Optical Carrier, Level 192 (9953.28 Mb/s) (10 Gb/s)

OC3/STM1/1.3LR4
Optical Carrier 3/Synchronous Transport Module 1 port unit in the 1.3 mm range with four bidirectional long reach ports.

OC3/STM1/1.3SR4
Optical Carrier 3/Synchronous Transport Module 1 port unit in the 1.3 mm range with four bidirectional short reach ports.

OC12/STM4/1.3LR2
Optical Carrier 12/Synchronous Transport Module 4 port unit in the 1.3 mm range with two bidirectional long reach ports.

OC12/STM4/1.3SR2
Optical Carrier 12/Synchronous Transport Module 4 port unit in the 1.3 mm range with two bidirectional short reach ports.

OC48/STM16
Optical Carrier 48/Synchronous Transport Module 16 port unit (generic reference to all OC48/STM16 port units).

OC48/STM16/1.3LR1
Optical Carrier 48/Synchronous Transport Module 16 port unit in the 1.3 mm range with one bidirectional long reach port.

OC48/STM16/1.5LR1

Optical Carrier 48/Synchronous Transport Module 16 port unit in the 1.5 mm range with one bidirectional long reach port.

OC48/STM16/DWDM01-16

Optical Carrier 48/Synchronous Transport Module 16 port unit in 16 different wavelengths that are compatible with ITU wavelengths and WaveStar OLS 40G/80G without OTUs.

OC48/STM16/POU

Optical Carrier 48/Synchronous Transport Module 16 Passive Optic Unit port unit in 16 different wavelengths that are compatible with passive optical applications with dense wavelength division multiplexing systems. The 16 different codes of OC48/STM16/POU port units are each designated by a 4-digit numeric suffix that corresponds to the frequency of the optical signal.

OC48/STM16/WDM

Optical Carrier 48/Synchronous Transport Module 16 Wavelength Division Multiplexing port unit in the 1.5 mm range with one bidirectional short/intermediate reach port. The 80 different codes of OC48/STM16/WDM port units are each designated by a 4-digit numeric suffix that corresponds to the frequency of the optical signal. The OC48/STM16/WDM port units support 80 wavelengths for applications with WaveStar OLS 400G dense wavelength division multiplexing systems without OTUs.

OC192/STM64/1.5IR1

Optical Carrier 192/Synchronous Transport Module 64 port unit in the 1.5 mm range with one bidirectional extended intermediate reach port.

OC192/STM64/1.5SR1

Optical Carrier 192/Synchronous Transport Module 64 port unit in the 1.5 mm range with one bidirectional short/intermediate reach port.

OC192/STM64/POU

Optical Carrier 192/Synchronous Transport Module 64 Passive Optic Unit port unit in 16 different wavelengths that are compatible with passive optical applications with dense wavelength division multiplexing systems. The 16 different codes of OC192/STM64/POU port units are each designated by a 4-digit numeric suffix that corresponds to the frequency of the optical signal.

OC192/STM64/1.5IRS1

Optical Carrier 192/Synchronous Transport Module 64 port unit in the 1.5 mm range with one bidirectional intermediate reach port with Strong Forward Error

Correction.

OC192/STM64/WDM

Optical Carrier 192/Synchronous Transport Module 64 Wavelength Division Multiplexing port unit in the 1.5 mm range with one bidirectional short/ intermediate reach port. The 40 different codes of OC192/STM64/WDM port units are each designated by a 4-digit numeric suffix that corresponds to the frequency of the optical signal. The OC192/STM64/WDM port units support 40 wavelengths for applications with WaveStar OLS 400G dense wavelength division multiplexing systems without OTUs.

ODF

Optical Distribution Frame

OI

Operations Interworking

OLS

Optical Line System

OOF

Out-of-Frame

OOS

Out-of-Service

OPS/INE

Operations System for Intelligent Network Elements

OS

Operations System

OSI

Open Systems Interconnection

OSMINE

Operations Systems Modifications for the Integration of Network Elements

OTU

Optical Translator Unit (WaveStar OLS)

P **PCB**

Printed Circuit Board

PCM
Pulse Code Modulation

PCMCIA
Personal Computer Memory Card International Association

PDH
Plesiochronous Digital Hierarchy

PI
Physical Interface

PM
Performance Monitoring

PMA
Performance Monitoring Application

PMD
Polarization Mode Dispersion

POH
Path Overhead

POP
Point of Presence

POTS
Plain Old Telephone Service

PP
Pointer Processing

PPROC/FO
Pointer Processor circuit pack for 192 STS-1/64 STM-1 equivalents with fan out

PRC
Primary Reference Clock

PRI
Primary

PROTN
Protection

PROV
Provisioned

PSA
Partially Service Affecting

PSDN
Public Switched Data Network

PSF
Power Supply Filter

PSTN
Public Switched Telephone Network

PTE
Path Terminating Equipment

PTY
Parity

PVC
Permanent Virtual Circuit

PWR
Power

PWR ON
Power On

Q

QAF
Q Adapter Function (in NE)

QL
Quality Level

QOS
Quality of Service

QRSS
Quasi-Random Signal Source

R **RAM**
Random Access Memory

RCV
Receive

RCVR
Receiver

RDI
Remote Defect Indication

REI
Remote Error Indicator

RF
Radio Frequency

RFI
Remote Failure Indication

RPP
Reliability Prediction Procedure

RSOH
Regenerator Section OverHead; part of SOH

RST
Regenerator Section Termination

RT
Remote Terminal

RTRV
Retrieve

RZ
Return to Zero

S **SA**
Service Affecting

SAI
Station Alarm Interface

SASE
Stand Alone Synchronization Equipment

SCI
Station Clock Input

SCO
Station Clock Output

SD
Signal Degrade

SDH
Synchronous Digital Hierarchy

SDS
Standard Directory Service based on ANSI recommendation T1.245

SEC
Secondary

SES
Severely Errored Seconds

SF
Super Frame (DS1 signal format)

SFEC
Strong Forward Error Correction

SLC
Subscriber Loop Carrier

SH
Short Haul

SNR
Signal-to-Noise Ratio

SOH
Section Overhead

SONET
Synchronous Optical Network

SPE
Synchronous Payload Envelope

SR
Short Reach

SSM
Synchronization Status Marker

SSU_L
Synchronization Supply Unit — Local

SSU_T
Synchronization Supply Unit — Transit

STBY
Standby

STM-1, STM-N
Synchronous Transport Module, Levels 1 and N (155.52 Mb/s)

STM-4
Synchronous Transport Module Level 4 (622.08 Mb/s)

STM-4c
Synchronous Transport Module Level 4 Concatenated Signal (622.08 Mb/s)

STM-16
Synchronous Transport Module Level 16 (2488.32 Mb/s) (2.5 Gb/s)

STM-64
Synchronous Transport Module Level 64 (9953.28 Mb/s) (10 Gb/s)

STS
Synchronous Transport Signal

STS-1, STS-N
Synchronous Transport Signal, Levels 1 and N

STS-3
Synchronous Transport, Level 3

STS-3c
Synchronous Transport, Level 3 Concatenated Signal

STS-12
Synchronous Transport, Level 12

STS-12c
Synchronous Transport, Level 12Concatenated Signal

SVC
Switched Virtual Circuit

SWC
Switch Center

SWIEX
Switch Interface Expander circuit pack

SWIF
Switch Interface circuit pack

SWITCH/DS3EC1
Switch circuit pack for 1xN DS3EC1/8 port unit protection switching

SWITCH/STM1E4
Switch circuit pack for 1xN STM1E/4 port unit protection switching

SWITCH/DS3EC1
Electrical Protection Switch for up to 96 DS3 or EC-1 signals port unit

SWITCH/STS576
576X576 STS-1/192x192 STM-1 Switch circuit pack

SWITCH/STS768
768X768 STS-1/256x256 STM-1 Switch circuit pack

SYNC
Synchronizer

T **TA**
Technical Advisory

TABS
Telemetry Asynchronous Byte Serial (Protocol)

TARP
Target Identifiers Address Resolution Protocol

TBD
To Be Determined

TBOS
Telemetry Byte-Oriented Serial (Protocol)

TCA
Threshold-Crossing Alert

TDM
Time Division Multiplexing

THz
Terrahertz (1012 Hz)

TID
Target Identifier

TIRKS
Trunks Integrated Records Keeping System

TL1
Transaction Language 1

TMG/STRAT3
Stratum 3 Timing circuit pack

TR
Technical Requirement

TSA
Time Slot Assignment

TSI
Time Slot Interchange

TSO
Technical Support Organization

TU
Tributary Unit

TUG
Tributary Unit Group

U

UAS
Unavailable Seconds

UITS
Unacknowledged Information Transfer Service. Unconfirmed mode of LAPD operation.

UNEQ
Path Unequipped

UPSR
Unidirectional Path-Switched Ring

V

V
Volts

VAC
Volts Alternating Current

VC
Virtual Container

VDC
Volts Direct Current

VF
Voice frequency

VM
Violation Monitor

VMR
Violation, Monitor, and Removal

VT
Virtual Tributary

VT1.5
Virtual Tributary, Level 1.5

VT-G
Virtual Tributary Group

W **WAD**
Wavelength Add/Drop

WAN
Wide Area Network

WaveStar™ OLS 40G/80G/400G
WaveStar Optical Line System 40G/80G/400G

WaveStar™ SNMS
WaveStar SubNetwork Management System (formerly known as ITM SNC [Integrated Transport Management SubNetwork Controller])

WDCS
Wideband Digital Cross-Connect System

WDM
Wavelength Division Multiplexing

WRT
Wait to Restore Time

X **X.25**
An ITU standard defining the connection between a terminal and a public packet-switched network

Glossary

Numerics

0x1 Line Operation
0x1 means unprotected operation. The connection between network elements has one bidirectional line (no protection line).

1+1 Active Unit State
Indicates which unit (working or protection) is active.

1+1 Line Protection
A protection architecture in which the transmitting equipment transmits a valid signal on both the working and protection lines. The receiving equipment monitors both lines. Based on performance criteria and OS control, the receiving equipment chooses one line as the active line and designates the other as the standby line.

10G I/O Bay
A 10G I/O Bay is capable of housing one or two 10G I/O Shelves. Each 10G I/O Shelf is divided into a CTL/Switch Interface Sub-Shelf and a Facility/SWIF Interface Sub-Shelf.

10G I/O Shelf
A 10G I/O Shelf may be of housed in a 10G I/O Bay or a 10G/Universal I/O Bay. The 10G I/O Shelf is divided into a CTL/Switch Interface Sub-Shelf and a Facility/SWIF Interface Sub-Shelf.

10G/Universal I/O Bay
A 10G/Universal I/O Bay is capable of housing two shelves. The 10G I/O Shelf (bottom) is divided into a CTL/Switch Interface Sub-Shelf and a Facility/SWIF Interface Sub-Shelf. The Universal I/O Shelf (top) is divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

10G/STM1e I/O Bay
A 10G/STM1e I/O Bay is capable of housing two shelves. The 10G I/O Shelf (bottom) is divided into a CTL/Switch Interface Sub-Shelf and a Facility/SWIF Interface Sub-Shelf. The STM1e Universal I/O Shelf (top) is divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

576x576 STS-1 Switch (SWITCH/STS576)
The SWITCH/STS576 circuit pack provides a 576x576 STS-1 equivalent (192x192 STM-1 equivalent) cross-connect function.

768x768 STS-1 Switch (SWITCH/STS768)
The SWITCH/STS768 circuit pack provides a 768x768 STS-1 equivalent (256x256 STM-1 equivalent) cross-connect function.

4608/1536 Platform
The equipment configuration that supports a 4608 STS-1/1536 STM-1 equivalent non-blocking service cross-connection capacity.

4608/1536 Switch Center
A 4608/1536 Switch Center is one fully-equipped Switch Shelf.

4608/1536 Switch Complex
A 4608/1536 Switch Complex is two Switch Bays or one Control/Switch Bay and one Switch Bay. Each bay is equipped with one fully-equipped Switch Shelf.

A

Absent (ABS)
Used to indicate that a given circuit pack is not installed.

Access Identifier (AID)
A technical specification for explicitly naming entities (both physical and logical) of an NE using a grammar comprised of ASCII text, keywords, and grammar rules.

Active (ACT)
Used to indicate that a circuit pack or module is in-service and currently providing service functions.

Active Path
One of two signals entering a constituent path selector, the active path is the path currently being selected.

Add Connection
For the input side, it is any tributary from which the user can provision a cross-connection, in any port or port protection group which is NOT a BLSR/MS-SPRing. For the output side, it is any tributary to which the user can provision a cross-connection, in any port protection group which is a BLSR/MS-SPRing.

Add/Drop Multiplexer (ADM)
The term for a synchronous network element capable of combining signals of different rates and having those signals added to or dropped from the stream.

ADJCTL/DCC
Circuit pack that terminates 32 DCC channels. Two ADJCTL/DCC circuit pack are used in the System Controller Shelf.

ADJCTL/DCCEI
Circuit pack that combines the functionality of the ADJCTL/DCC and CTL/EI circuit packs. The ADJCTL/

DCCEI circuit pack is used in the 10G I/O Shelf, the STM1e Universal I/O Shelf, and the Universal I/O Shelf.

Alarm
Visible or audible signal indicating that an equipment failure or significant event/condition has occurred.

Alarm Correlation
The search for a directly-reported alarm that can account for a given symptomatic condition.

Alarm Cut-Off (ACO)
A button on the user panel used to silence audible alarms.

Alarm Cut-Off and Test (ACO/TST)
The name of a pushbutton on the user panel used to silence audible alarms.

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 that indicates that an upstream failure has been detected and alarmed, if the upstream alarm has not been suppressed.

Alarm Severity
An attribute defining the priority of the alarm message. The way alarms are processed depends on the severity.

Alarm Severity Assignment Profile (ASAP)
A user provisioned mechanism to control an alarm level.

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.

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.

APS Channel
The signalling channel carried in the K1 and K2 bytes of the SONET overhead on the protection line. It is used to exchange requests and acknowledgments for protection switch actions.

Association
A logical connection between manager and agent through which management information can be exchanged.

Asynchronous
The essential characteristic of time-scales or signals such that their corresponding significant instants do not necessarily occur at the same average rate.

Asynchronous Transfer Mode (ATM)
A high-speed transmission technology characterized by high bandwidth and low delay. It utilizes a packet switching and multiplexing technique which allocates bandwidth on demand.

Attribute
Alarm indication level: critical, major, minor, or no alarm.

Autolock
Action taken by the system in the event of circuit pack failure/trouble. System switches to protection and prevents a return to the working circuit pack even if the trouble clears. Multiple protection switches on a circuit pack during a short period of time cause the system to autolock the pack.

Autolock State
A state of the 1xN protection switch group with priority above “Automatic Protection Switching”, and below the commands Clear, Lockout, and Forced Switch. The Autolock State supports the following two states: Locked – indicating the existence of an autolock condition, in which traffic from a particular service circuit pack is locked to protection, Unlocked – indicating no autolock condition is present and normal 1xN protection switching is occurring.

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 Protection Switch
A protection switch that occurs automatically in response to an automatically detected fault condition.

Autonomous Message
A message transmitted from the controlled Network Element to the ITM-SC which was not a response to an ITM-SC originated command.

Auto-Provisioning

The ability to detect the presence of equipment, validate it, and then assign the original values to the newly created entity's programmable parameters. These parameters are maintained in NVM and/or hardware registers. If a user has predefined some (or all) of the parameters associated with the entity, the auto-provisioning function validates the request, perhaps using some of the pre-provisioned data, and then assigns the programmable parameter values accordingly.

Avalanche Photodiode (APD)

A diode that increases its electrical conductivity by a multiplication effect when hit by light. APDs are used in lightwave receivers because the APDs have a greater sensitivity to weakened light signals (for example, those which have traveled long distances over fiber).

B

Backout to a Previous Generic

The user initiated procedure whereby the system reverts from the current/most recent generic and back-to the previous generic.

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.

Bidirectional Line

A transmission path consisting of two fibers that handle traffic in both the transmit and receive directions.

Bidirectional Line-Switched Ring (BLSR)

A bidirectional ring in which protection switching is accomplished by switching working traffic into protection time slots in the line going in the opposite direction around the ring. BLSRs are functionally equivalent to SDH Multiplexer Section Shared Protection Rings (MS-SPRings).

Bidirectional Ring

A ring in which both directions of traffic between any two nodes travel through the same network elements (although in opposite directions).

Bidirectional Switch

Protection switching performed in both the transmit and receive directions.

Bipolar 3-Zero Substitution (B3ZS)
A line coding technique that replaces three consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: first, this bit sequence accommodates the density requirements of the ones for digital T3 carrier, second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

Bipolar 8-Zero Substitution (B8ZS)
A line coding technique that replaces eight consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: First, this bit sequence accommodates the density requirements of the ones for digital T1 carrier; Second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

Bit
The smallest unit of information in a computer, with a value of either 0 or 1.

Bit Error Rate (BER)
The ratio of error bits received to the total number of bits transmitted.

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).

BITS clock
A BITS (Building Integrated Timing Source) clock is simply a clock within a central office that distributes timing to all the equipment in that central office. The BITS clock is tied to an external, stable timing source, such as a GPS (global positioning satellite).

Blank (BLK)
The status of a circuit pack slot that contains a bus extender (blank) circuit pack.

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.

Bridge Cross-Connection
The setting up of a cross-connection leg with the same input tributary as that of an existing cross-connection leg. Thus, forming a 1:2 bridge from an input tributary to two output tributaries.

Broadband Communications
Voice, data, and/or video communications at greater than 2 Mb/s rates.

Building Integrated Timing Supply (BITS)
A single clock that provides all the DS1 and/or composite clock timing reference to all other clocks in that building.

Byte
Refers to a group of eight consecutive binary digits.

Byte Switch (BSW)
A BSW (slice) circuit pack serves as a cross-connect at the byte level between STS-1/STM-1 signals for 4608x4608/1536x1536 switching.

C

C-Bit
A framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3. This format provides for enhanced performance monitoring of both near-end and far-end entities.

Cell Relay
Fixed length cells. For example, ATM with 53 octets.

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.

Channel State Provisioning
A feature that allows a user to suppress reporting of alarms and events during provisioning by supporting multiple states (automatic, in-service, and not monitored) for VT1.5 and STS-1 channels.

Circuit
A set of transmission channels through one or more network elements that provides transmission of signals between two points, to support a single communications path.

Clear Channel (CC)
A digital circuit where no framing or control bits are required, thus making the full bandwidth available for communications.

Clear Command
Clears any active WaveStar CIT switch request. Clear can be directed to a single electrical interface (working or protection) or to all electrical interfaces. The clear command is used to clear a Lockout, Forced Switch, or Manual Switch conditions, as well as release a Wait-to-Restore.

Closed 4-Fiber BLSR
When all four ports of the BLSR are selected, then the user can provision one of the four ports as the “East

Working Port”, one port as the “East Protection Port”, one port as the “West Working Port” and one port as the “West Protection Port.” This arrangement is sometimes referred to as a two-sided node.

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.

Coding Violation (CV)
A performance monitoring parameter indicating that bipolar violations of the signal have occurred.

Collocated
System elements that are located in the same location.

Command Group
An administrator-defined group that defines commands to which a user has access.

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.

Constituent Path Selector
A path-level protection switching function that selects the better of two constituent signals in the two logical input tributaries and operates at the constituent signal rate. A path protection group in a cross-connection with an STS-3 or STS-12/STM-1 or STM-4 “pipe” cross-connection rate provides path-level protection switching for all the constituent signals carried by the cross-connection. There may be one or more constituent path selectors operating independently within each path protection group, one for each constituent signal in the logical output tributary. The path protection group adapts to the current constituent signal rates.

Constituent Signal
A signal at a constituent signal rate that is carried by a cross-connection leg.

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).

Control Complex
A Control Complex includes one equipped System Controller Bay or one Control/Switch Bay, which provides the main control functions for WaveStar BandWidth Manager.

Control/Switch Bay

The Control/Switch Bay is capable of housing a System Controller Shelf and a Switch Shelf.

Control/Switch Complex

A Control/Switch Complex comprises either one equipped System Controller Bay and two Switch Bays or one Control/Switch Bay and one Switch Bay. A Control/Switch Complex provides the main control and switching functions for WaveStar BandWidth Manager.

Control System Interface Expander (CSIEX)

The CSIEX circuit pack expands CTLI-D interfaces that connect to the SWIEX circuit packs and the SEC memory circuit packs. The CSIEX circuit pack also expands ON (Operations Network) interfaces that connect to the Facility Interface Sub-Shelf

Co-Resident

A hardware configuration where two applications can be active at the same time independently on the same hardware and software platform without interfering with each others functioning.

Correlation

A process where related hard failure alarms are identified.

Craft Interface Terminal (CIT)

The user interface terminal used by craft personnel to communicate with a network element.

Critical (CR)

Alarm that indicates a severe, service-affecting condition.

Cross-Connect Capacity

The total bandwidth of cross-connections as measured by the bandwidth of input and output tributaries. A system with N STS-1/STM-1 equivalent input tributaries and N STS-1/STM-1 equivalent output tributaries (referred to as “NxN”) provides a cross-connection capacity of N STS-1/STM-1 equivalents. This system could provide N one-way point-to-point cross-connections or N2 two-way point-to-point cross-connections at the equivalent rate of STS-1/STM-1.

Cross-Connect Loopback

A cross-connection from an input tributary to the output of that same tributary via the cross-connect fabric.

Cross-Connect Rate

The attribute of a cross-connection that defines the constituent signal rate(s) it can carry. For a cross-connection with an STS-3/STM-1 “pipe” cross-connection rate, the constituent signals carried by the cross-connection can be either an STS-3c/STM-1c signal or three STS-3/STM-1 signals. Similarly, for a cross-connection with an STS-12/STM-4 “pipe” cross-connection rate, the constituent signals carried by the cross-connection can be either an STS-12c/STM-4c signal or an allowed mix of STS-12c/STM-1c signals and STS-3/STM-1 signals.

Cross-Connect Topologies
The different types of cross-connections, or configurations, that may be provisioned. These include: bridging, path-protected, and point-to-point. The topology of a cross-connection defines the number of legs in the cross-connection, whether the inputs and/or outputs of some legs are the same logical tributary, and whether any path protection groups are included.

Cross-Connection
Path-level connections between input and output tributaries or specific ports within a single NE. Cross-connections are made in a consistent way even though there are various types of ports and various types of port protection. Cross-Connections are reconfigurable interconnections between tributaries of transmission interfaces.

Cross-Connection Leg
A one-way connection provisioned from one logical input tributary to one logical output tributary. Each leg is identified as an entity by its logical input and output tributaries, its cross-connection rate, and the type of cross-connection topology. The operation of retrieving cross-connections can be done in terms of cross-connection legs between specific logical tributaries.

Cross-Connection Type
A provisionable parameter whereby the user selects the type as 1 Way Point to Point, or 2 Way Point to Point.

Crosstalk
An unwanted signal introduced into one transmission line from another.

CTL/EI
Circuit pack that selects the 10Base-T from an ADJCTL/DCC circuit pack and routes it to the backplane.

CTL/MEM
The CTL/MEM circuit pack stores information for WaveStar BandWidth Manager. A CTL/MEM circuit pack may be designated as either PRI (Primary) or SEC (Secondary).

CTL/SR50DC
The CTL/SR50DC circuit pack is a main controller (without memory) for WaveStar BandWidth Manager. The CTL/SR50DC is part of the 10G I/O Shelf.

CTL/Switch Interface Sub-Shelf
The top portion of a 10G I/O Shelf which is equipped with ten SWITCH/STS768 packs, two TMG/STRAT3 packs, two CTL/SR50DC packs, and four PPROC/FO packs.

CTL/SYS50D
The SYS50D circuit pack is a main controller (without memory) for WaveStar BandWidth Manager. The SYS50D is part of the System Controller Shelf.

CTL/SYS50DM

The SYS50DM circuit pack is a main controller for WaveStar BandWidth Manager. Two SYS50DM circuit packs are included in all modules of the Facility Interface Sub-.

Current Value

The value currently assigned to a provisionable parameter.

Cut-Through

Refers to a simple ASCII interface to an NE. It enables the user to send TL1 messages directly to the NE with no interpretation or assistance provided by the WaveStar CIT.

D

Data

A collection of system parameters and their associated values.

Database Administrator

A user who administers the database of the application.

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 signal conversion and coding between the data terminating equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. A DCE may perform other functions usually performed at the network end of the line.

Data Terminating Equipment (DTE)

The equipment that originates data for transmission and accepts transmitted data.

DDM-1000

Lucent Technologies' Dual DS3 Multiplexer – A digital multiplexer that multiplexes DS1, DS1C, or DS2 signals into a DS3 signal or a 90 Mb/s or 180 Mb/s optical signal.

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 work in existing asynchronous as well as the emerging SONET networks. Multiplexers that multiplex DS1, DS3, or EC-1 inputs into EC-1, OC-1, OC-3, or OC-12 outputs.

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.

Defect
A limited interruption of the ability of an item to perform a required function. It may or may not lead to maintenance action depending on the results of additional analysis.

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.

Deprovisioning
The inverse order of provisioning. To manually remove/delete a parameter that has (or parameters that have) previously been provisioned.

Digital Cross-Connect Panel (DSX)
A panel designed to interconnect equipment that operates at a designated rate. For example, a DSX-3 interconnects equipment operating at the DS3-rate.

Digital Multiplexer
Equipment that combines several digital signals into a single composite digital signal by time-division multiplexing.

Digital Signal Levels 0, 1, 3 (DS0, DS1, DS3)
An ANSI-defined signal or service level corresponding to the following: DS0 is 64 Kb/s, DS1 is 1.544 Mb/s (equivalent to T1), and DS3 is 44.736 Mb/s (equivalent to 28 T1 channels or T3).

Dimmed
The state of a control whose normal functionality is not currently available to a user (also referred to as grayed or disabled).

Directory Name
An ASCII string that fully specifies the path and the name of the target directory where the generic to be downloaded, the database to be restored, or the database to be backed up is to be found.

Directory Service Network Element (DSNE)
A designated network element that is responsible for administering a database that maps network element names (TIDs) to addresses [NSAPs (network service access points)] in an OSI subnetwork. There can be

one DSNE per ring. A DSNE can also be a GNE.

Dispersion
Time-broadening of a transmitted light pulse.

Dispersion Shifted Optical Fiber
1330/1550 nm minimum dispersion wavelength.

Divergence
When there is unequal amplification of incoming wavelengths, the result is a power divergence between wavelengths.

Doping
The addition of impurities to a substance in order to attain desired properties.

Double Click
To click twice rapidly with the left mouse button. This executes the default command in the Right Click Pop-up Menu. If there is no default command, then double-clicking will have no effect.

Downstream
At or towards the destination of the considered transmission stream, for example, looking in the same direction of transmission.

Downstream Pack
Given a pack-to-pack interface, the downstream pack is the receiving pack.

Drop and Continue
A circuit configuration that provides redundant signal appearances at the outputs of two network elements in a ring. Can be used for Dual Ring Interworking (DRI) and for video distribution applications.

Drop-Down Menu
A menu that is displayed from a menu bar.

DS1 Signal
Signal with a data rate of 1.544 Mb/s.

DS3EC1/8
Port unit that provides 8 bidirectional ports at the DS3-rate or EC-1-rate.

DS3EC1 Connector Panel
The two panels on one or both sides of a Facility Interface Sub-Shelf (Universal I/O Shelf) containing DS3EC1/8 port units. The DS3EC1/8 Connector Panels provide an interface between the DS3EC1/8 port units and the backplane via BNC connectors.

DS3 Format
Specifies the line format of a DS3 interface port, such as M23 or C-bit parity.

DS3 Idle Signal
A signal that can be applied to any output port that is not cross-connected to an input port. This signal lets downstream network elements know that the facility is operating normally even though it is not sending a normal DS3 signal.

DS3 Signal
A logical or electrical B3ZS signal with a data rate of 44.736 Mb/s.

DSX-1, 2, 3
Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the DS1, DS2, or DS3 level.

Dual Ring Interworking (DRI)
A topology in which two rings are interconnected at two nodes on each ring and operate so that inter-ring traffic is not lost in the event of a node or link failure at an interconnecting point.

E

Electrical Carrier, Level 1 (EC-1)
An electrical interface signal at the SONET rate of STS-1.

Electrical Module
One of the ways the bottom portion of a Universal I/O Shelf, the Facility Interface Sub-Shelf, may be populated. DS3EC1/8 port units are used to populate an Electrical Module.

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.

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.

Entire System Start-Up Stage A
The amount of time from power-on reset (including system controller downloads to the individual controllers) until transmission is up. This should normally be less than 5 minutes.

Entire System Start-Up Stage B

The amount of time from power-on reset until the system is completely available for any external commands. This should normally be less than 5 minutes.

Entity

A specific piece of hardware (usually a circuit pack, slot, or module) that has been assigned a name recognized by the system.

Entity Identifier

The name used by the system to refer to a circuit pack, memory device, or communications link.

Equipment Fail (EF) State

The protection group shall enter the EF state when any of its circuit packs are in the EF state, and no higher priority request (for example, Clear, Forced Switch) is present. The protection group leaves the EF state when all EF indications are cleared, or a higher priority request is received.

Equipment Protection

Relates to the DS3 and EC-1 electrical interfaces, which are protected by 1xN equipment protection. This means that protection switching for electrical interfaces is supported at the level of the port unit (circuit pack).

Equipped (EQ)

Status of a circuit pack or interface module that is in the system database and physically in the frame, but not yet provisioned.

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 “type A” is a second with exactly one error; ES “type B” is a second with more than one and less than the number of errors in a severely errored second for the given signal. ES by itself means the sum of the type A and type B ESs.

Establish

A user initiated command, at the WaveStar CIT, to create an entity and its associated attributes in the absence of certain hardware.

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Event
A significant change. Events in controlled Network Elements include signal failures, equipment failures, signals exceeding thresholds, and protection switch activity. When an event occurs in a controlled Network Element, the controlled Network Element will generate an alarm or status message and send it to the management system.

Event Driven
A required characteristic of a network element or software system: NEs are reactive systems, primarily viewed as systems that wait for and then handle events. Events are provided by the external interface packages, the hardware resource packages, and also by the software itself.

Exclude
A user initiated command, at the WaveStar CIT, to remove an entity from service.

Externally Timed
An operating condition of a clock in which it is locked to an external reference and is using time constants that are altered to quickly bring the local oscillator's frequency into approximate agreement with the synchronization reference frequency.

Extract
To physically remove a circuit pack from a slot, thus causing a system initiated removal of an entity from service.

Extra traffic
Unprotected traffic that is carried over protection channels when their capacity is not used for the protection of working traffic.

F

Facility
A one- or two-way circuit that carries a transmission signal.

Facility Interface Sub-Shelf
The bottom portion of a Universal I/O Shelf or an STM1e Universal I/O Shelf which may be equipped, depending on the port units and circuit packs used, as a DS3EC1 Electrical, Optical, or a Mixed Module (Universal I/O Shelf) or an STM1e Electrical or Mixed Module (STM1e Universal I/O Shelf).

Facility Loopback
A facility loopback is where an entire line is looped back.

Facility Roll
The disconnection of the circuit cross-connecting input tributary to an output tributary followed, within the required completion time (≤2.5 ms), by a cross-connection of an input tributary to an output tributary.

Facility/SWIF Interface Sub-Shelf

The bottom portion of a 10G I/O Shelf which may be equipped with OC192/STM64 port units and one to four pairs of SWIF packs.

Failures in Time (FIT)

Circuit pack failure rates per 109 hours as calculated using the method described in Reliability Prediction Procedure for Electronic Equipment, Telcordia Method I, Issue 5, September 1995.

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 Block Error (FEBE)

An indication returned to the transmitting node that an errored block has been detected at the receiving node. A block is a specified grouping of bits.

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).

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.

Fiber Distributed Data Interface (FDDI)

Fiber interface that connects computers and distributes data among them.

File Transfer and Access Management (FTAM)

FTAM is the Open Systems Interconnection (OSI) standard for file transfer, file access, and file management.

Flash EPROM

A technology that combines the nonvolatility of EPROM with the in-circuit reprogrammability of EEPROM (electrically-erasable PROM).

Folded Rings

Folded (collapsed) rings are rings without fiber diversity. The terminology derives from the image of folding a ring into a linear segment.

Forced

Term used when a circuit pack (either working or protection) has been locked into a service-providing state by user command.

Forced Switch to Protection

The WaveStar CIT command that forces the protection group to be the “Active Unit.” The clear command is required to remove the Forced Switch state. While in the Forced Switch state the system may not switch the active unit either automatically, by means of the WaveStar CIT Forced Switch, or Manual Switch command.

Forward Error Correction (FEC)

A technique used by a receiver to correct errors incurred during transmissions over a communications channel without requiring retransmission of any information by the transmitter. FEC typically involves a convolution of the transmitter using a common algorithm and embedding sufficient redundant information in the data block to allow the receiver to correct. While this technique is processor-intensive, it improves the efficiency of the network.

Frame

The smallest block of digital data being transmitted.

Frame Relay (FR)

A form of packet switching that relies on high-quality phone lines to minimize errors. It is very good at handling high-speed, bursty data over wide area networks. The frames are variable lengths and error checking is done at the end points.

Framework

An assembly of equipment units, such as a rack, that is capable of housing shelves.

Free Running

An operating condition of a clock in which its local oscillator is not locked to an internal synchronization reference and is using no storage techniques to sustain its accuracy.

FT-2000 ADR

Lucent Technologies’ OC-48 rate Add/Drop Rings lightwave Terminal for 2-fiber BLSRs. It is designed primarily for interoffice applications. It supports adds, drop, and through connections for DS3/EC-1, OC-3, IS-3, and OC-12.

G

Gateway Network Element (GNE)

A network element that passes information between other network elements and management systems through a data communication network.

H

Hard Failure

An unrecoverable nonsymptomatic (primary) failure that causes signal impairment or interferes with critical network functions, such as DCC operation.

High Level Data Link Control (HDLC)
OSI reference model datalink layer protocol.

Holdover
An operating condition of a clock in which its local oscillator is not locked to an external reference but is using storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronization reference.

Host Controller
The NSAP of the subject NE.

Hot Keys
A keyboard key or key combination that invokes a particular command.

Hot Standby
A circuit pack ready for fast, automatic placement into operation to replace an active circuit pack. It has the same signal as the service going through it, so that choice is all that is required.

Human Machine Language (MML)
A standard language developed by the ITU for describing the interaction between humans and dumb terminals.

I

Idle
An output port not cross-connected to an input port.

Idle Code
A signal transmitted downstream automatically from an idle output port. It can also be transmitted downstream by a manual command from a cross-connected output port.

Include
A user initiated command, at the WaveStar CIT, to restore an entity to service.

Individual Controller Start-Up Stage A
The amount of time from power-on reset until transmission is established for an individual controller. This should normally be less than 2.5 minutes.

Individual Controller Start-Up Stage B
The amount of time from power-on reset until the individual controller is completely available for any external commands. This should normally be less than 3 minutes.

Insert
To physically insert a circuit pack into a slot, thus causing a system-initiated restoral of an entity into service and/or creation of an entity and associated attributes.

In-Service (IS)
A memory administrative state for ports. IS refers to a port that is fully monitored and alarmed.

Integrated Transport Management Network Module (ITM NM)
Lucent Technologies' integrated network management system that provides a broad end-to-end view of the SONET network.

Integrated Transport Management SubNetwork Controller (ITM SNC)
Lucent Technologies' SONET element management layer system that provides fault, configuration, and security functions through the use of a GUI.

Interface Capacity
The total number of STS-1/STM-1 equivalents (bidirectional) tributaries in all transmission interfaces with which a given I/O Shelf can be equipped at one time. The interface capacity varies with equipage.

I/O Complex
There are two types of I/O Complexes: local and remote (future). A local I/O Complex is one or more collocated Universal I/O Bays that are electrically cabled to an associated Switch Complex. A remote I/O Complex (future) is one or more I/O Bays that are located up to 1000 cable-feet away from and optically connected (using optical remoting) to an associated Switch Complex.

J

Jitter
Short term variations of amplitude and frequency components of a digital signal from their ideal position in time.

L

Lead Time
The time interval between placement of a product order and receipt of the product.

Lightguide Build-Out (LBO)
An attenuating (signal-reducing) element used to keep an optical output signal strength within desired limits.

Lightguide Cross-Connect (LGX)
A SONET device that contains ports for optical fiber connections to an optical network element (NE). An LGX is used to make and change connections to an NE without changing the cabling on the NE itself.

Line
A transmission medium, together with the associated equipment, required to provide the means of transporting information between two consecutive network elements. One network element originates the line signal; the other terminates it.

Line Build Out (LBO)
An equalizer network that guarantees the proper signal level and shape at the DSX panel.

Line Controller Local Area Network (LCLAN)
The internal local area network that provides communications between the controlled circuit packs.

Line Protection
The optical interfaces can be protected by line protection. Line protection switching protects against failures of line facilities, including the interfaces at both ends of a line, the optical fibers, and any equipment between the two ends. Line protection includes protection of equipment failures.

Line Timing
Refers to a network element that derives its timing from an incoming OC-N/STM-N signal.

Line Timing

Link
The mapping between in-ports and out-ports. It specifies how components are connected to one another.

Literal Character
A letter, digit, or symbol that is entered in a command. The first hyphen in UNIT-{1-64} is a literal character; the braces and the second hyphen are not literal characters.

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 I/O Complex
A local I/O Complex is one or more co-located Universal I/O Bays that are electrically cabled to an associated Switch Complex.

Location
An identifier for a specific circuit pack, interface module, interface port, or communications link.

Lockout of Protection
The WaveStar CIT command that prevents the system from switching traffic to the protection line from a working line. If the protection line is active when a “Lockout of Protection” is entered – this command causes the working line to be selected. The protection line is then locked from any Automatic, Manual, or Forced protection switches.

Lockout State
The Lockout State shall be defined for each working or protection circuit pack. The two permitted states are: None – no lockout is set for the circuit pack, Set – the circuit pack has been locked out. The values

(None & Set) shall be taken independently for each working or protection circuit pack.

Logical Tributary
With regards to electrical ports and unprotected optical ports – a logical tributary is the same as the port tributary. With regards to port protection groups – a logical tributary is a path-level unit of bandwidth within a port protection group.

Loopback
Type of diagnostic test used to compare an original transmitted signal with the resulting received signal. A loopback is established when the received optical or electrical external transmission signal is sent from a port or tributary input directly back toward the output.

Loop Timing
A special case of line timing. It applies to network elements that have only one OC-N/STM-N interface. For example, terminating nodes in a linear network are loop timed.

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.

M

M23-Format
A standard framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3 (sometimes referred to as M13-format, without C-bit parity).

Major
Indicates a service-affecting failure, main or unit controller failure, or power supply failure.

Maintenance Condition
An equipment state in which some normal service functions are suspended, either because of a problem or to perform special functions (copy memory) that can not be performed while normal service is being provided.

Manual Switch State
A protection group shall enter the Manual Switch State upon the initiation and successful completion of the Manual Switch command. The protection group leaves the Manual Switch state by means of the Clear or

Forced Switch commands. While in the Manual Switch state the system may switch the active unit automatically if required for protection switching.

Mapping
The logical association of one set of values, such as addresses on one network, with quantities or values of another set, such as devices or addresses on another network.

Mediation Device (MD)
Allows for exchange of management information between Operations System and Network Elements.

Mid-Span Meet
The capability to interface between two lightwave network elements of different vendors. This applies to high-speed optical interfaces.

Minor (MN)
Indicates a non-service-affecting failure of equipment or facility.

Miscellaneous Discrete Interface
Allows an operations system to control and monitor equipment collocated within a set of input and output contact closures.

Mixed Module
One of the ways the bottom portion of an STM1e Universal I/O Shelf or a Universal I/O Shelf, the Facility Interface Sub-Shelf, may be populated. A combination of OC48/STM16, OC12/STM4, OC3/STM1, and DS3EC1/8 port units is used to populate a Mixed Module (Universal I/O Shelf). A combination of OC48/STM16, OC12/STM4, OC3/STM1, and STM1E/4 port units is used to populate a Mixed Module (an STM1e Universal I/O Shelf).

Modify
A user initiated command, at the WaveStar CIT, to modify attributes within an existing entity.

Module
Term used to designate an equipped shelf. For example, a SWIF Module is a Switch Interface Sub-Shelf that is equipped with SWIF packs.

Multiplexer
A device (circuit pack) that combines two or more transmission signals into a combined signal on a shared medium.

Multiplexer Section Shared Protection Ring (MS-SPRing)
A ring in which protection switching is accomplished by switching working traffic into protection time slots in the line going in the opposite direction around the ring. MS-SPRings are functionally equivalent to SONET Bidirectional Line-Switched Rings (BLSRs).

Multiplexing
The process of combining multiple signals into a larger signal at the transmitter by a multiplexer. The large signal is then split into the original smaller signals at the receiver by a demultiplexer.

N

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 (NSAP) Address
Network Service Access Point Address (used in the OSI network layer 3). An automatically assigned number that uniquely identifies a Network Element for the purposes of routing DCC messages.

Node
A network element in a ring or, more generally, in any type of network. In a network element supporting interfaces to more than one ring, node refers to an interface that is in a particular ring. Node is also defined as all equipment that is controlled by one system controller. A node is not always directly manageable by a management system.

Non-Blocking Service Cross-Connection Capacity
The service cross-connection capacity that is guaranteed to the user to be free from blocking. The system architecture allows for terminating a total transmission capacity on the transmission interfaces that is in excess of the non-blocking service cross-connection capacity of the system. Only the capacity that can be terminated on the main cross-connection fabric without blocking makes up the non-blocking service cross-connection capacity.

Non-Preemptible Protection Access (NPPA)
Non-preemptible protection access increases the available span capacity for traffic which does not require protection by a ring, but which cannot be preempted.

Non-Revertive Switching
In non-revertive switching, an active and standby line exist on the network. When a protection switch occurs, the standby line is selected to support traffic, thereby becoming the active line. The original active line then becomes the standby line. This status remains in effect even when the fault clears. That is, there is no automatic switch back to the original status.

Non-Volatile Memory (NVM)
Memory that retains its stored data after power has been removed. An example of NVM would be a hard disk.

No Request State

This is the routine-operation quiet state in which no external command activities are occurring.

Not Monitored (NMON)

A provisioning state for equipment that is not monitored or alarmed.

O

On-Cable Identifier

Also known as the Physical Shelf Identifier. This is a user provisionable parameter.

One-Way Path-Protected Cross-Connection

A two-legged interconnection between two STS-N/STM-N input tributaries and one STS-N/STM-N output tributary. It consists of one path protected group with two legs, a working leg and a protection leg. The path protection group is provisioned to provide path-level protection switching for all the constituent signals carried by the cross-connection. Each leg must be at the same cross-connection rate.

One-Way Point-to-Point Cross-Connection

A one-legged interconnection, that supports one-way transmission, between an input tributary and an output tributary at a particular transmission rate (for example, STS-1/STM-1).

One-Way Roll Cross-Connection

An operation consisting of moving the INPUT of any existing leg of any cross-connection from a given tributary to a second tributary, while leaving the output unchanged. Typically, a roll is used as a tail-end switch in a facility or tributary rolling operation, whereby traffic is moved from the facility to another or from one tributary to another on the facility. The head-end side of a facility or tributary roll usually has a bridge established (in one NE) so that the traffic flows on both the old and new facilities. This serves to minimize the signal interruption time when the roll is carried out to that introduced by the roll itself (in the other NE). A roll is inherently a one-way operation, but because facilities are generally two-way, a head-end bridge/tail-end roll sequence is typically done on both directions.

Open 4-Fiber BLSR/MS-SPRing

When only two ports of the BLSR/MS-SPRing are selected, then the user can provision the two ports in either of two ways, (a) one port as the “West Working Port” and one port as “West Protection Port”, or (b) one port as the “East Working Port” and one port as “East Protection Port.” This arrangement is also sometimes referred to as a one-sided node.

Open Ring Network

A network formed of a linear chain-shaped configuration of network elements. Each network element connects to two others, one on each side, except for two network elements at the ends which are connected on only one side. A closed ring can be formed by adding a connection between the two end nodes.

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, user panel, WaveStar CIT, office alarms, and all telemetry interfaces.

Operations Interworking (OI)
The capability to access, operate, provision, and administer remote systems through craft interface access from any site in a SONET/SDH network or from a centralized operations system.

Operations System (OS)
A central computer-based system used to provide operations, administration, and maintenance functions.

Operations System for Intelligent Network Elements (OPS/INE)
A Telcordia configuration management operations system.

Operator
A user of the system with operator-level user privileges.

Optical Carrier 3/Synchronous Transport Module 1 (OC3/STM1)
The OC3/STM1 port unit provides a bidirectional port which is provisionable at either the OC-3- or STM-1-rate. The OC3/STM1 port unit is used in the OC3/STM1 Optical Modules and the Mixed Modules of the Facility Interface Sub-Shelf.

Optical Carrier 12/Synchronous Transport Module 4 (OC12/STM4)
The OC12/STM4 port unit provides a bidirectional port which is provisionable at either the OC-12- or STM-4-rate. The OC12/STM4 port unit is used in the OC12/STM4 Optical Modules and the Mixed Modules of the Facility Interface Sub-Shelf.

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. The OC48/STM16 port unit is used in the OC48/STM16 Optical Modules and the Mixed Modules of a Facility Interface Sub-Shelf.

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. The OC192/STM64 port unit is used in the OC192/STM64 Optical Module of the Facility/SWIF Interface Sub-Shelf of the 10G I/O Shelf.

Optical Carrier N (OC-N)
An optical carrier signal at the SONET rate of N, where N equals 1, 3, 12, 48, or 192. The basic rate of an OC-1 signal is 51.84 Mb/s, equivalent to an STS-1, with other values of N direct multiples of this basic rate.

Optical Channel

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 Line Signal

A multiplexed optical signal containing multiple wavelengths or channels.

Optical Module

One of the three ways the bottom portion of a Universal I/O Shelf, the Facility Interface Sub-Shelf of a Universal I/O Shelf, may be populated. Either OC48/STM16, OC12/STM4, or OC3/STM1 port units are used to populate optical modules. The Facility/SWIF Interface Sub-Shelf of a 10G I/O Shelf may be equipped with OC192/STM64 port units.

Original Value Provisioning

Preprogramming of a system's original values at the factory. These values can be overridden using local or remote provisioning.

Outage

A disruption of service that lasts for more than 1 second.

Out-of-Service

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.

P

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.

Pass-Through

Paths that are cross-connected directly across an intermediate node in a network.

Path

A logical connection between the point at which a standard frame format for the signal at the given rate is assembled, and the point at which the standard frame format for the signal is disassembled.

Path Overhead (POH)

Informational bytes assigned to, and transported with the payload until the payload is demultiplexed. It provides for integrity of communication between the point of assembly of a virtual container and its point of disassembly.

Path Protection Group
The part of a cross-connection topology that is provisioned to provide path-level protection switching for all the constituent signals carried by the cross-connection. A path protection group can be identified as an entity by its logical output tributary and its cross-connection rate. A path protection group consists of one or more constituent path selectors.

Path Terminating Equipment
Network elements in which the path overhead is terminated.

Performance Monitoring (PM)
Measures the quality of service and identifies degrading or marginally operating systems (before an alarm would be generated).

Peripheral Control and Timing Facility Interface (PCTFI)
A proprietary physical link interface supporting the transport of 21x2 Mb/s signals.

Platform
A family of equipment and software configurations designed to support a particular application.

Plesiochronous Network
A network that contains multiple subnetworks, each internally synchronous and all operating at the same nominal frequency, but whose timing may be slightly different at any particular instant.

Polarization Mode Dispersion (PMD)
Output pulse broadening due to random coupling of the two polarization modes in an optical fiber.

Port (also called Line)
The physical interface, consisting of both an input and output, where an electrical or optical transmission interface is connected to the system and may be used to carry traffic between network elements. The words “port” and “line” may often be used synonymously. “Port” emphasizes the physical interface, and “line” emphasizes the interconnection. Either may be used to identify the signal being carried.

Port Protection Group
A user provisioned association of protected optical interface ports. This association is used for line protection. The group of ports represent both a protection switching entity and also a set of lines that carry services to/from another network element. The port protection groups also determine the set of logical tributaries from and to which cross-connections can be provisioned.

Port State Provisioning
A feature that allows a user to suppress alarm reporting and performance monitoring during provisioning by supporting multiple states (automatic, in-service, and not monitored) for low-speed ports.

Port Tributary
A path-level unit of bandwidth within a port, or the constituent signal/signals being carried in this unit of

bandwidth. It may generally be assumed that a port tributary is an STS-1/STM-1 tributary unless specified otherwise. For a port which is NOT in a port protection group (electrical port or unprotected group), a port tributary is the same entity as a logical tributary.

Port Unit
A transmission circuit pack that receives and transmits optical or electrical signals.

PPROC/FO
The PPROC/FO circuit pack, located in the CTL/Switch Interface Sub-Shelf of the 10G I/O Shelf, provides an interface between the OC192/STM64 port units and the SWITCH/STS768 packs.

Preprovisioning
The process by which the user specifies parameter values for an entity in advance of some of the equipment being present. These parameters are maintained only in NVM. These modifications are initiated locally or remotely by either a CIT or an OS. Preprovisioning provides for the decoupling of manual intervention tasks (for example, install circuit packs) from those tasks associated with configuring the node to provide services (for example, specifying the entities to be cross-connected).

Primary (PRI)
Designates a CTL/MEM circuit pack as the primary storage device for WaveStar BandWidth Manager.

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 failure or signal degrade defect.

Protection
Extra capacity (channels, circuit packs) in transmission equipment that is not intended to be used for service, but rather to serve as backup against equipment failures.

Protection Access
To provision traffic to be carried by protection tributaries when the port tributaries are not being used to carry the protected working traffic.

Protection AID
This shall be the port AID which has been assigned to be the protection port.

Protection Group Configuration
The members of a group and their roles, for example, working protection, line number, etc.

Protection Path
One of two signals entering a path selector used for path protection switching or dual ring interworking. The other is the working path. The designations working and protection are provisioned by the user, whereas the terms active path and standby path indicate the current protection state.

Protection Port Alarm Status
The highest alarm status associated with the protection port. Values shall be: Critical, Major, Minor, or Not Alarmed.

Protection State
When the working unit is currently considered active by the system and that it is carrying traffic. The “active unit state” specifically refers to the receive direction of operation — since protection switching is unidirectional.

Protection Tributary
A port tributary which can be used to protect the traffic carried by a working tributary in a port protection group, or a Logical Tributary that is associated with a Working Tributary within a common port protection group.

Provisioned (PROV)
Indicating that a circuit pack is ready to perform its intended function. A provisioned circuit pack can be active (ACT), in-service (IS), standby (STBY), provisioned out-of-service (POS), or out-of-service (OOS).

Provisioning
The modification of certain programmable parameters that define how the node functions with various installed entities. These modifications are initiated locally or remotely by either a CIT or an OS. They may arrive at the node via the IAO LAN, CIT port, or any DCC channel. The provisioned data is maintained in NVM and/or hardware registers.

R

Radio Buttons
A standard Windows control that allows a user to select from a fixed set of mutually exclusive choices (also referred to as option buttons).

Reactive Maintenance
Refers to detecting defects/failures and clearing them.

Rearrangement
An internal roll feature that allows for removing fragmented bandwidths between shelves. The roll is an “errorless roll” between connections. The rearrangement function allows the repositioning of STS-1/ STM-1 or STS-3/STM-1 tributaries from the SWITCH/STS576 to the BSW or the HS switch. The reason for repositioning tributaries is to make STS-1s/STM-1s contiguous, and therefore, prevent blocking situations when cross-connecting concatenated signals.

Receive-Direction
The direction towards the Network Element.

Regeneration
The process of reconstructing a digital signal to eliminate the effects of noise and distortion.

Reliability
The ability of a software system performing its required functions under stated conditions for a stated period of time. The probability for an equipment to fulfill its function. Some of the ways in which reliability is measured are: MTBF (Mean Time Between Failures) expressed in hours; Availability = (MTBF)/(MTBF+MTTR)(%) [where MTTR = mean time to restore]; outage in minutes per year; failures per hour; percentage of failures per 1,000 hours.

Remote Defect Indication (RDI)
An indication returned to a transmitting terminal that the receiving terminal has detected an incoming section failure. [Previously called far-end-receive failure (FERF).]

Remote Failure Indication (RFI)
A signal that alerts upstream path-terminating equipment that a downstream failure has been alarmed along the path. This action prevents multiple alarms from being activated for the same failure and ensures that a technician is dispatched to correct the failure. (Previously called yellow signals.)

Remote Network Element
Any Network Element that is connected to the referenced Network Element through either an electrical or optical link. It may be the adjacent node on a ring, or N nodes away from the reference. It also may be at the same physical location but is usually at another (remote) site.

Remove
A user initiated command at the WaveStar CIT to delete an entity and its associated attributes from the system.

Reservations
Allows the user the option of “reserving” any tributaries on any transmission interfaces for the following two purposes: first, to enhance cross-connection completion performance and second, to allow an OS that does not have all of the information needed to make such cross-connections. The reservation of a tributary creates a two-way connection for that tributary between the transmission interface (for example, OC48/STM16, etc.) and the interface to the main cross-connection fabric (SWIF circuit pack), but not through the main cross-connect fabric (BSW). If tributaries at both ends of a desired cross-connection have these established connections, then a subsequent request to make a cross-connection between these tributaries needs only to operate on the main cross-connect fabric, not on the main fabric plus two interface shelf fabrics.

Retrieve
A user initiated command at the WaveStar CIT to retrieve an entity state/status from the NE.

Return to Zero
A code form having two information states (termed zero and one) and having a third state or an at-rest condition to which the signal returns during each period.

Revertive

A protection switching mode in which, after a protection switch occurs, the equipment returns to the nominal configuration (that is, the working equipment is active, and the protection equipment is standby) after any failure conditions that caused a protection switch to occur, clear, or after any external switch commands are reset. (See “Non-Revertive.”)

Revertive Switching

In revertive switching, there is a working and protection high-speed line, circuit pack, etc. When a protection switch occurs, the protection line, circuit pack, etc. is selected. When the fault clears, service “reverts” to the working line.

Right Click

To select an object by pressing and releasing the right mouse button which brings up a Right Click Pop-up Menu. The default command may be brought up by double-clicking on an object with the right mouse button.

Right Click Pop-up Menu (RCPM)

A menu which is displayed at the location of a selected object; the commands contained within the RCPM are contextually relevant to that object. Users may configure mouse buttons to their preferences, so that the pop-up menu may in fact be accessed via the left mouse button. The default menu item, if any, is shown in bold.

Ring

A configuration of nodes comprised of network elements connected in a circular fashion. Under normal conditions, each node is interconnected with its neighbor and includes capacity for transmission in either direction between adjacent nodes. Path switched rings use a head-end bridge and tail-end switch. Line switched rings actively reroute traffic over the protection capacity.

Ring Side

When an optical interface is provisioned as a member of a port protection group for a specific type of protection, the port (line) is assigned a ring-side (West or East) and/or line name (working or protection) to identify its role. A 4-fiber BLSR/MS-SPRing has four lines identified by West and East ring-sides and as working and protection lines within each side. With 1+1 line protection there are two lines identified as working and protection lines. With 1xN line protection there are N+1 lines identified as working lines through N and a protection line.

Roll Cross-Connection

A user operation which results in moving the input of any existing leg of any cross-connection from a given tributary to a second tributary, while leaving the output unchanged. Typically, a roll is used as a tail-end switch in a “facility or tributary rolling” operation, whereby traffic is moved from one facility to another or from one tributary to another on a facility. The head-end side of a facility or tributary roll usually has a bridge established (in one NE) so that the traffic flows on both the old and new facilities, minimizing the signal interruption time when the roll is carried out to that introduced by the roll itself (in the other NE). A roll is inherently a one-way operation, but because facilities are generally two-way, a head-end bridge/tail-end roll sequence is typically done on both directions.

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.

S

Secondary (SEC)
Designates a secondary CTL/MEM circuit pack as the secondary storage device for WaveStar BandWidth Manager.

Section
The portion of a transmission facility, including terminating points, between a terminal network element and a line-terminating network element, or two line-terminating network elements.

Section Layer
The second of the four levels in a standard SONET signal, used to transport an STS frame across a physical medium. This layer uses the photonic layer to form the physical transport.

Self-Healing
A network's ability to automatically recover from the failure of one or more of its components.

Server
Computer in a computer network that performs dedicated main tasks which generally require sufficient performance.

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.

Service
The operational mode of a physical entity that indicates that the entity is providing service. This designation will change with each switch action.

Service Cross-Connection Capacity
The capacity that can be used for carrying service traffic. Any cross-connection capacity that is required for transmission interface protection switching is separate and does not reduce the service cross-connection capacity.

Service Preserving Reset
A reset on a controller that does not cause transmission hardware devices to be reset. Transmission service

is preserved in the sense that the devices continue to operate and carry service.

Service Preserving Reset With Database Reload from NVM
A service preserving reset in which the database will be loaded from NVM into RAM and device settings will be rewritten to reflect values stored in NVM. If the values in NVM disagree with current device settings in hardware, then transmission could be impacted when new device settings are written.

Shelf View
A graphical depiction of one shelf. Selectable objects in this view are the shelf, the slots/circuit packs, and the ports.

Shortcut Key
A keyboard key or key combination that invokes a particular command. Also referred to as an accelerator key or a hot key.

Signal-to-Noise Ratio (SNR)
The relative strength of signal compared to noise.

Signal Rate
An attribute that defines the bit-rate and format of the signal. The signal rate is defined by the STS-N path-level signal bit-rate and format including the presence or absence of concatenation.

Single-Ended Operations
Provides operations support from a single location to remote Network Elements in the same SONET subnetwork. With this capability you can perform operations, administration, maintenance, and provisioning on a centralized basis. The remote Network Elements can be those that are specified for the current release.

Single-Mode Fiber (SM)
An 8-m diameter low-loss, long-span optical fiber typically operating at either 1310 nm, 1550 nm, or both.

Site Address
The unique address for a Network Element.

Slot
A physical position in a shelf for holding a circuit pack and connecting it to the backplane. This term is also used loosely to refer to the collection of ports or tributaries connected to a physical circuit pack placed in a slot.

Slot Provisioned
A slot will transition from empty to equipped when the circuit pack insertion is detected, validated, and the hardware registers are loaded. The slot remains so provisioned until the object is deprovisioned.

Software Backup

The process of saving an image of the current network element's databases, which are contained in its NVM, to a remote location. The remote location could be the WaveStar CIT or an OS.

Software Download

The process of transferring a generic (full or partial) or provisioned database from a remote entity to the target network element's memory. The remote entity may be the WaveStar CIT or an OS. The download procedure uses bulk transfer to move an uninterpreted binary file into the network element.

Software ID

Number that provides the software version information for the system.

Software Installation

The process of actually interpreting and unpacking the binary program of data, that was loaded in the NVM by a previous software download operation, and copying the constituent data items to their designated locations within the network element's memory.

Software Restore

The inverse of a Software Backup. The process of simultaneously copying the backed-up database, from the remote location, to the current network element's Primary-0 NVM and Primary-1 NVM.

Software Upgrade

A combination of the (a) software download, (b) install, and (c) commit process. An upgrade is performed when the system software is to be changed to a new release.

Span

An uninterrupted bidirectional fiber section between two network elements.

Span Growth

A type of growth in which one wavelength is added to all lines before the next wavelength is added.

Squelch Map

This map contains information for each cross-connection in a ring and indicates the source and destination nodes for the low-speed circuit that is part of the cross-connection. This information is used to prevent traffic misconnection in rings with isolated nodes or segments.

Standby

The circuit pack is in service but is not providing service functions. It is ready to be used to replace a similar circuit pack either by protection or by duplex switching.

Standby Path

One of two signals entering a constituent path selector, the standby path is the path not currently being selected.

State
The state of a circuit pack indicates whether it is defective or normal (ready for normal use).

Status
The indication of a short-term change in the system.

STM-1 Equivalent
Unit of cross-connection capacity in terms of STM-1 bandwidth units, independent of the actual mix of cross-connection rates.

STM1E/4
Port unit that provides 4 bidirectional ports at the STM-1e-rate.

STM1e Connector Panel
The two panels on one or both sides of a Facility Interface Sub-Shelf (STM1e Universal I/O Shelf) containing STM1E/4 port units. The STM1e Connector Panels provide an interface between the STM1E/4 port units and the backplane via 43-type or 1.6/5.6 connectors.

STM1e I/O Bay
An STM1e I/O Bay is capable of housing two STM1e Universal I/O Shelves. The STM1e Universal I/O Shelves are each divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

STM1e Universal I/O Shelf
An STM1e Universal I/O Shelf may be housed in an STM1e I/O Bay or a 10G/STM1e I/O Bay. The STM1e Universal I/O Shelves are each divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

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.

STS-1 Equivalent
Unit of cross-connection capacity in terms of STS-1 bandwidth units, independent of the actual mix of cross-connection rates.

STS-1
The basic building block logical signal in the SONET standard with a data rate of 51.84 Mb/s.

STSX-1
Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the STS-1 level.

Subnetwork
A group of interconnected/interrelated Network Elements. The most common connotation is a synchronous

network in which the Network Elements have data communications channel (DCC) connectivity.

Suppression
A process where service-affecting alarms that have been identified as an “effect” are not displayed to a user.

SWIF Module
A SWIF Module is a Switch Interface Sub-Shelf equipped with either one pair (96 STS-1/32 STM-1 equivalents) or two pairs (192 STS-1/64 STM-1 equivalents) of SWIF packs.

Switch Bay
A Switch Bay is equipped with a fully-equipped Switch Shelf. The spaces above and below the Switch Shelf are reserved for future features.

Switch Center (SWC)
Logical grouping of BSW switch packs, TMG/STRAT3 circuit packs and SWIEX circuit packs in a Switch Shelf. The number of these circuit packs needed for a SWC depends on the size of the switch.

Switch Complex
The 4608/1536 Switch Complex includes two Switch Bays or one Control/Switch Bay and one Switch Bay. The 9216/3072 Switch Complex includes four Switch Bays or one Control/Switch Bay and three Switch Bays. Each bay is equipped with one fully-equipped Switch Shelf.

Switch Interface (SWIF)
The SWIF circuit pack converts TXI data format into the byte-sliced format utilized by the BSW circuit pack.

Switch Interface Capacity
The service-carrying capacity STS-1/in STM-1 equivalent “Inter-Connection Links” between the transmission interface shelves and the main cross-connection fabric. Each STS-1/STM-1 equivalent of switch interface bandwidth interconnects to one STS-1/STM-1 equivalent of main fabric bandwidth (that is to say, one STS-1/STM-1 equivalent inlet and one STS-1/STM-1 equivalent outlet). The sum of all the switch interface capacity that can be equipped in the system is equal to the non-blocking service cross-connection capacity of the system.

Switch Interface Sub-Shelf
The top portion of a Universal I/O Shelf which may be equipped, depending on the port units and circuit packs used, with either one or two pairs of SWIF circuit packs. The Switch Interface Sub-Shelf provides the interface between the transmission port units in the Facility Interface Sub-Shelf and the main switch fabric provided by the Switch Shelves.

SWITCH/DS3EC1
Port unit responsible for implementing DS3EC1/8 1x12 protection switching for up to 96 DS3 or EC-1 signals.

SWITCH/STM1E4
Port unit responsible for implementing STM1E/4 1x8 protection switching.

Switch Shelf
The Switch Shelf is located in the middle of a Switch Bay or below a System Controller Shelf in a Control/ Switch Bay. A fully-equipped Switch Shelf contains 16 BSW circuit packs (for 4608/1536 switching) and two TMG and SWIEX circuit packs.

Synchronization Messaging
Synchronization messaging is used to communicate the quality of network timing, internal timing status, and timing states throughout a subnetwork.

Synchronous
The essential characteristic of time scales or signals such that their corresponding significant instances occur at precisely the same average rate, generally traceable to a single Stratum-1 source.

Synchronous Digital Hierarchy (SDH)
A hierarchical set of digital transport structures, standardized for the transport of suitable adapted payloads over transmission networks.

Synchronous Network
The synchronization of transmission systems with synchronous payloads to a master (network) clock that can be traced to a reference clock.

Synchronous Optical Network (SONET)
The North American standard for the rates and formats that defines optical signals and their constituents.

Synchronous Payload
Payloads that can be derived from a network transmission signal by removing integral numbers of bits from every frame. Therefore, no variable bit-stuffing rate adjustments are required to fit the payload in the transmission signal.

Synchronous Payload Envelope (SPE)
The combined payload and path overhead of an STS-1, STS-3c, STS-12c or STS-48c signal.

Synchronous Transport Signal (STS, STS-N)
The basic logical building block signal for SONET with a rate of 51.84 Mb/s for an STS-1 signal and a rate of N times 51.84 Mb/s for an STS-N signal.

Synchronous Transport Signal, Level N, Concatenated (STS-Nc)
A concatenated SONET payload signal at the STS-N rate, where N equals 3, 12, or 48. For example, an STS-3c signal is constructed by concatenating three STS-1 signals into a signal that uses a single path overhead, rather than three.

System Controller Bay

The bottom shelf is available to house the NCC and the middle shelf is equipped with a System Controller Shelf.

System Controller Shelf

Located in the middle shelf of the System Controller Bay or the top of a Control/Switch Bay, the System Controller Shelf houses the main controllers for WaveStar BandWidth Manager.

System View

A graphical depiction of the entire Network Element. Selectable objects in this view are the bays and shelves.

T

T1

A carrier system that transmits at the rate of 1.544 Mb/s (a DS1 signal).

T2

A carrier system that transmits at the rate of 6.312 Mbps (a DS2 signal).

T3

A carrier system that transmits at the rate of 44.736 Mbps (a DS3 signal).

Target Identifier (TID)

A provisionable parameter that is used to identify a particular Network Element within a network. It is a character string of up to 20 characters where the characters are letters, digits, or hyphens (-).

Telcordia Technologies

Telcordia Technologies (formerly Bellcore) is a well-recognized telecommunications' standards organization.

Test Access

A set of cross-connection topologies used in conjunction with a testing system to monitor and "split" signal paths for purposes of fault isolation.

Through (or Continue) Cross-Connection

A cross-connection within a ring, where the input and output tributaries have the same tributary number but are in lines opposite each other.

Threshold-Crossing Alert (TCA)

A message type sent from a Network Element that indicates that a certain performance monitoring parameter has exceeded a specified threshold.

Through Timing

Refers to a network element that derives its transmit timing in the east direction from a received line signal in the east direction and its transmit timing in the west direction from a received line signal in the west direction.

Time Division Multiplexing (TDM)
A technique for transmitting a number of separate data, voice, and/or video signals simultaneously over one communications medium by interleaving a portion of each signal one after another.

Time Slot Assignment (TSA)
A capability that allows any tributary in a ring to be cross-connected to any tributary in any lower-rate, non-ring interface or to the same-numbered tributary in the opposite side of the ring.

Time Slot Interchange (TSI)
The ability of the user to assign cross-connections between any tributaries of any lines within a Network Element. Three types of TSI can be defined: Hairpin TSI, Interring TSI (between rings), and Intraring TSI (within rings).

Timing/Stratum 3 (TMG/STRAT3)
TMG/STRAT3 circuit pack provides a Stratum 3 clock for its shelves.

Tooltip
A standard Windows control that provides a small pop-up window that provides descriptive text (such as a label) for a control or graphic object.

Transaction Language One (TL1)
A machine-to-machine communications language that is a subset of ITU’s human-machine language.

Transmit-Direction
The direction outwards from the Network Element.

Tributary
A path-level unit of bandwidth within a port, or the constituent signal(s) being carried in this unit of bandwidth, for example, an STS-1 tributary within an OC-N port.

True Wave™ Optical Fiber
Lucent Technologies’ fiber generally called non-zero dispersion-shift fiber, with a controlled amount of chromatic dispersion designed for amplified systems in the 1550/1310 nm range.

Two-Way Point-to-Point Cross-Connection
A two-legged interconnection, that supports two-way transmission, between two and only two tributaries.

Two-Way Roll
The operation which moves a two-way cross-connection between tributary i and tributary j to a two-way cross-connection between the same tributary i and a new tributary k with a single user command.

U

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.

Unidirectional Path-Switched Ring (UPSR)

Path-Switched rings employ redundant fiber optic transmission facilities in a pair configuration, with one fiber transmitting in one direction (for example, East) and the backup fiber transmitting in the other direction (for example, West). If the primary ring fails, then the protection ring takes over.

Universal I/O Bay

A Universal I/O Bay is capable of housing two Universal I/O Shelves. The Universal I/O Shelves are each divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

Universal I/O Shelf

A Universal I/O Shelf may be housed in a Universal I/O Bay or a 10G/Universal I/O Bay. The Universal I/O Shelves are each divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

Upstream

At or towards the source of the considered transmission stream, for example, looking in the opposite direction of transmission.

Upstream Pack

Given a pack-to-pack interface, the upstream pack is the transmitting pack.

User Privilege

Permits a user must perform on the computer system on which the system software runs.

User-to-Network Interface (UNI)

The specifications for the procedures and protocols between a user and the Asynchronous Transfer Mode (ATM) network.

V

Value

A number, text string, or other menu selection associated with a parameter.

Variable

An item of data named by an identifier. Each variable has a type, such as Int or Object, and a scope.

Violation Monitor and Removal (VMR)

A provisionable mode for DS3 output that causes parity violations to be monitored and corrected before the DS3 signal is B3ZS encoded.

Virtual
Refers to artificial objects created by a computer to help the system control shared resources.

Virtual Circuit
A logical connection through a data communication (for example, X.25) network.

Virtual Tributary (VT)
A structure designed for transport and switching of sub-STS-1 payloads. There are currently four sizes: VT1.5 (1.728 Mb/s), VT2 (2.304 Mb/s), VT3 (3.456 Mb/s), and VT6 (6.912 Mb/s).

Virtual Tributary Group (VT-G)
A 9-row by 12-column structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte interleaved with the VT-organized synchronous payload envelope.

Voice Frequency (VF) Circuit
A 64 kilobit per second digitized signal.

Volatile Memory
Type of memory that is lost if electrical power is interrupted.

VT1.5 Tributary
A SONET logical signal with a data rate of 1.728 Mbps. In the 9-row structure of the STS-1 SPE, a VT1.5 occupies three columns. VT-structured STS-1 SPEs are divided into seven VT groups. Each VT group occupies twelve columns of the 9-row structure and, for VT1.5s, contains four VTs per group.

W

Wait-to-Restore (WTR)
Applies to revertive switching operation. The protection group enters the WTR state when all Equipment Fail (EF) conditions are cleared, but the system has not yet reverted back to its working line. The protection group remains in the WTR state until the Wait-to-Restore timer completes the WTR time interval.

Wait to Restore Time (WRT)
Corresponds to the time to wait before switching back after a failure has cleared (in a revertive protection scheme). The WRT can be between 0 and 15 minutes, in increments of one minute.

Wavelength Add/Drop (WAD)
The process of adding and dropping wavelengths to provide more efficient transmission.

Wavelength Division Multiplexing (WDM)
A means of increasing the information-carrying capacity of an optical fiber by simultaneously transmitting signals at different wavelengths.

Wavelength Interchange
The ability to change the wavelength associated with an OC-N signal into another wavelength.

WaveStar™ Optical Line System
Lucent Technologies' lightwave transmission system. Utilizing DWDM technology, the system combines multiple signals of different wavelengths, transmits the resulting signal over a single fiber, and then demultiplexes the signal at the receive end.

WaveStar™ SNMS
WaveStar SubNetwork Management System (formerly known as ITM SNC [Integrated Transport Management SubNetwork Controller]).

Wide Area Network (WAN)
A communication network that uses common-carrier provided lines and covers an extended geographical area.

Wideband Communications
Voice, data, and/or video communication at digital rates from 64 kb/s to 2 Mb/s.

Wizard
A form of user assistance that automates a task through a dialog with the user.

Working
Label attached to a physical entity. In case of revertive switching the working line or unit is the entity that is carrying service under normal operation. In case of nonrevertive switching the label has no particular meaning.

Working AID
This shall be the port AID which has been assigned to be the working port.

Working Path
One of two signals entering a constituent path selector, the working path is the path carried by the working cross-connection leg of the path protection group.

Working Port Alarm Status
The highest alarm status associated with the working port. Values are: Critical, Major, Minor, or Not Alarmed.

Working State
A working unit that is currently considered active by the system and is carrying traffic in the working state.

Working Tributary (same as "service tributary")
A Logical Tributary. A member of a Protection Group. The tributary that is currently carrying traffic, but, which can be protected.

X **X.25 Interface/Protocol**

The ITU packet-switched interface standard for terminal access that specifies three protocol layers: physical, link, and packet for connection to a packet-switched data network.

X-Terminal

Workstation that can support an X-Windows interface.

Z **Zero Code Suppression**

A technique used to reduce the number of consecutive zeros in a line-coded signal (B3ZS, B8ZS).

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