

555-4031-814

Meridian SuperNode

# Commercial Systems

## Operational Measurements Reference Manual

MSL14 Standard 12.01 November 2000

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## Operational Measurements Reference Manual

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The MSL-100 system is certified by the Canadian Standards Association (CSA) with the Nationally Recognized Testing Laboratory (NRTL).

This equipment is capable of providing users with access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities is a violation of the Telephone Operator Consumer Service Improvement Act of 1990 and Part 68 of the FCC Rules.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### YEAR 2000 READINESS DISCLOSURE

This information was originally published prior to October 19, 1998. The foregoing legend applies retroactively in accordance with the U.S. Year 2000 Information and Readiness Act and on an ongoing basis.

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# Publication history

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To comply with Nortel Networks Technical Documentation Standards, the Publication history will contain updates for the current release and two prior releases.

## **November 2000**

Version 12.01, Standard, MSL14. This version represents an up issue of the standard release of this document.

## **May 2000**

Version 11.01, Standard, MSL12. This version represents the standard release of this document and includes some minor pagination and graphics differences from the previous version.

## **November 1999**

Version 10.01, Standard, MSL11. This version represents the standard release of this document and includes the following changes:

- added OM group C2USER
- replaced all occurrences of RSSPR2 with TRSPALA to reflect new field name
- replaced all occurrences of RSSPR3 with TRSONCT to reflect new field name



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# About this document

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## When to use this document

This document contains operational measurements (OM) descriptions for Meridian SuperNode. These OM groups provide information on switch performance and activity.

The Meridian SuperNode system organizes the collection, display, and recording of OM data. Hardware and software OM data is collected for activities such as traffic, feature use, and equipment use. Data is collected for individual pieces of equipment (such as attendant consoles), on a group basis (such as for trunk groups), or for an entire Meridian node. OM data can be used as a basis for maintenance, provisioning, network management, administration, and planning purposes.

**Note:** The MSL14 software delivery is part of an on-going evolution. This book is one of several transitional documents that must be used with the following DMS-100 and XPM counterparts for the full complement of documentation:

- *NADMS-100 Operational Measurements Reference Manual*, 297-8001-814
- *XPM Operational Measurements Reference Manual*, 297-8321-814

Disregard the signaling point (SP), Traffic Operator Position System (TOPS), and SuperNode Data Manager (SDM) information as it does not apply to the MSL-100 switch.

## How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the *next* software release cycle, the first release of the same document is 02.01.

The version and issue of the document are indicated by numbers, for example, 01.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but rereleased in the *same* software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

To determine which version of this document applies to the software in your office and how documentation for your product is organized, check the release information in *Product Documentation Directory*, 297-8991-001.

This document is written for all MSL-100 Family offices. More than one version of this document may exist. To determine which version of this document applies to the software in your office, check the release information in the *Master Index of Publications Documentation Directory*.

## References in this document

*Basic Administration Procedures*, 297-1001-300 is referred to in this document.

## What precautionary messages mean

The types of precautionary messages used in Nortel Networks documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task or the correct interpretation of information or data. Danger, warning, and caution messages indicate possible risks.

Examples of the precautionary messages follow.

ATTENTION      Information needed to perform a task

### **ATTENTION**

If the unused DS-3 ports are not deprovisioned before a DS-1/VT Mapper is installed, the DS-1 traffic will not be carried through the DS-1/VT Mapper, even though the DS-1/VT Mapper is properly provisioned.

---

**DANGER** Possibility of personal injury

**DANGER****Risk of electrocution**

Do not open the front panel of the inverter unless fuses F1, F2, and F3 have been removed. The inverter contains high-voltage lines. Until the fuses are removed, the high-voltage lines are active, and you risk being electrocuted.

**WARNING** Possibility of equipment damage

**WARNING****Damage to the backplane connector pins**

Align the card before seating it, to avoid bending the backplane connector pins. Use light thumb pressure to align the card with the connectors. Next, use the levers on the card to seat the card into the connectors.

**CAUTION** Possibility of service interruption or degradation

**CAUTION****Possible loss of service**

Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service will be lost if you remove a card from the active unit.

## How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

### Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

>BSY

**Commands and fixed parameters**

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

```
>BSY CTRL
```

**Variables**

Variables are shown in lowercase letters:

```
>BSY CTRL ctrl_no
```

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

**Responses**

Responses correspond to the MAP display and are shown in a different type:

```
FP 3 Busy CTRL 0: Command request has been submitted.
```

```
FP 3 Busy CTRL 0: Command passed.
```

---

# Operational measurement groups

---

## OM group descriptions

OM group descriptions are arranged alphabetically according to group name. Each group description includes one or more flow charts and a description of each register in the group.

Each volume restarts pagination at page 1. Because the operational measurement groups chapter spans three volumes, pagination of this chapter restarts in each volume.

OM groups are described using the following standard headings.

### OM description

This section provides an expanded acronym followed by a description of what the group counts and how this data can be used.

### Release history

This section shows the software release in which the group was created and lists subsequent changes by release number.

### Registers

This section shows the registers in the group as they appear on a MAP display.

### Group structure

This section describes the number of OM tuples, key fields, info fields, office parameters, tables, and other datafill information that pertains to the group.

### Associated OM groups

This section lists related OM groups and explains how they are related.

### Associated functional groups

This section lists the DMS products to which the OM group applies.

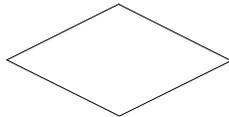
### Associated functionality codes

This section lists related functionality codes and their titles.

## Flow charts

A flow chart shows the sequence of events that causes the registers to be incremented and the relationship between the registers within the group. Usage registers are shown in separate flow charts. Flow charts always begin on the second page of the group description.

The following symbols are used in the flow charts:



indicates a yes/no decision



indicates an activity

## Register descriptions

Register descriptions are arranged alphabetically within each group. There are three types of registers:

- *Peg* registers are incremented when an event occurs.
- *Usage* registers record activities or states at time intervals of 10 or 100 seconds.
- *High-water* registers reflect the maximum number of items in simultaneous use during the current transfer period.

### Register name

This section provides an expanded acronym followed by a description of what the register counts.

If the description includes reference to registers from a different group, these are identified by the group name followed by an underscore and the register name. For example, OFZ\_ORGFSET refers to register ORGFSET in group OFZ.

### Register name release history

This section shows the software release when the register was created and lists subsequent changes by release number.

**Associated registers**

This section lists related registers and explains how they are related. This section can include validation formulae or useful equations. Registers from a different group are identified by a combination of the group name and register name, separated by an underscore: for example, OFZ\_ORGFSET.

**Associated logs**

This section lists logs that are generated, together with events that are counted or that are related to the interpretation of OM data.

**Extension register**

This section provides the name of the register used when the original register is full. The value should be multiplied by 65536 and added to the original register value to get the total count.

## OM group ASR

---

### OM description

Automatic Set Relocation

OM group Automatic Set Relocation (ASR) counts the number of sets that have been moved using ASR OUT and ASR IN process. Each time a set is brought back into the system using the ASR IN process, the ASR OM is incremented by one.

The count for ASRCKLN is incremented if a technician performs a CKLN on a set that performed the ASR OUT process but has not performed the ASR IN process.

#### To determine count, sets, and total sets

Count, sets, and total number of sets are determined as follows:

- The total number of sets that have been removed by the ASR process may be determined by looking at the count for ASROPASS.
- When completing the ASR process through ASR IN, the number of sets that have been moved to a new location may be determined by looking at the count of ASRINPAS.
- When completing the ASR process through CKLN, the number of sets that have been moved to a new location may be determined by looking at the count of ASRCKLN.
- The total number of sets that have been completed the ASR process (either through ASR OUT and ASR IN or through ASR OUT and CLKN) may be determined by adding the counts for ASRINPAS and ASRCKLN.

### Release history

OM group ASR was introduced prior to BCS31.

### Registers

The following OM group ASR registers display on the MAP terminal as follows:

ASRINPAS

ASROPASS

ASRCKLN

ASRCLN

### Group structure

OM group ASR

---

**OM group ASR** (continued)

---

**Key field:**  
not applicable

**Info field:**  
not applicable

**Associated OM groups**

None

**Associated functional groups**

None

**Associated functionality codes**

None

**Register ASRINPAS**

Register Automatic Set Relocation In Pass

Register ASRINPAS pegs once each time a sure moves a set using the ASR OUT and ASR IN process.

**Register ASRINPAS release history**

Register ASRINPAS was introduced prior to BCS31.

**Associated registers**

None

**Associated logs**

ASR Log ASR101 - Passed ASR IN

**Extension registers**

None

**Register ASROPASS**

Register Automatic Set Register Out Pass

Register ASROPASS counts the number of sets that have completed successfully the ASR OUT process.

**Register ASROPASS release history**

Register ASROPASS was introduced prior to BCS31.

## **OM group ASR** (continued)

---

### **Associated registers**

None

### **Associated logs**

ASR Log ASR100 - Passed ASR OUT

### **Extension registers**

None

## **Register ASRCKLN**

Register Automatic Set Relocation CKLN

Register ASRCKLN pegs each time a set is brought back into the system, following an ASR OUT, with the service order command CKLN.

### **Register ASRCKLN release history**

Register ASRCKLN was introduced in BCS31.

### **Associated registers**

None

### **Associated logs**

None

### **Extension registers**

None

## **Register ASRCLN**

Register Automatic Set Relocation CLN

Register ASRCLN is for future development and is not used at this time. ASR OUT does not support Integrated Business Network (IBN) terminals; therefore, the ASRCLN counter does not peg and cannot be incremented.

### **Register ASRCLN release history**

Register ASRCLN was introduced prior to BCS31.

### **Associated registers**

None

### **Associated logs**

None

**OM group ASR (end)**

---

**Extension registers**

None

## OM group IPERNGFL

---

### OM description

Intelligent Peripheral Equipment (IPE) Ring Failure

Intelligent Peripheral Equipment (IPE) Ring Failure identifies the number of analog sets associated with the IPE that have missed getting a ringing resource from the ringing generator of the IPE

### Release history

OM group IPERNGFL was introduced in release MSL07.

### Registers

The following OM group IPERNGFL registers display on the MAP terminal as follows:

RNGFAIL

Each IPE (0-255) is associated with one register for each field.

### Group structure

OM group IPERNGFL

Key field: <IPE\_NUMBER>

Info Field: <IPERNG\_FAIL\_INFO>

The key field has a range of 0 to 255 where the info field has a single field that supplies the shelf and card number of the IPE.

### Associated OM groups

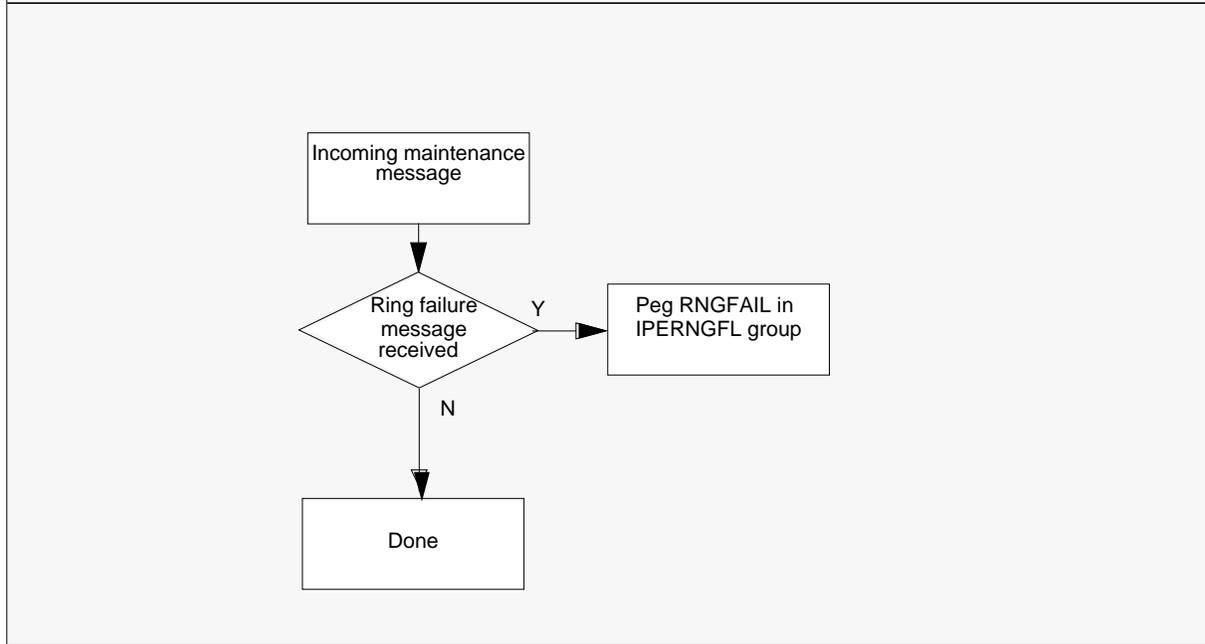
None

### Associated functional groups

None

### Associated functionality codes

None

**OM group IPERNGFL (end)****OM group IPERNGFL registers****Register RNGFAIL**

Register Ring Fail

Register RNGFAIL was introduced in MSL07.

**Register RNGFAL release history**

Register RNGFAIL was introduced in MSL07.

**Associated registers**

None

**Associated logs**

PM189 is generated to state which IPE and card are affected if a telephone set is denied a ringing resource.

**Extension registers**

None

## OM group SITE3

---

### OM description

Traffic and dial tone speed recording, remote sites 3

SITE3 provides statistics for Dial Tone Speed Recording (DTSR) on Intelligent Peripheral Equipment (IPE) for analog and digital lines. SITE3 contains 12 registers that count:

- the number of calls sampled on IPE Dial Pulse (DP) lines
- the number of calls sampled on IPE DP lines when the dial tone delay is more than 3 seconds
- the number of calls sampled on IPE Digitone (DT) lines
- the number of calls sampled on IPE DT lines when the dial tone delay is more than 3 seconds
- the number of calls sampled on IPE Key Set (KS) lines
- the number of calls sampled on IPE KS lines when the dial tone delay is more than 3 seconds

### Release history

OM group SITE3 was introduced in BCS32.

### Registers

OM group SITE3 registers display on the MAP terminal as follows:

IPEDP_T	IPEDP_T2	IPEDP_D	IPEDP_D2
IPEDT_T	IPEDT_T2	IPEDT_D	IPEDT_D2
IPEKS_T	IPEKS_T2	IPEKS_D	IPEKS_D2

### Group structure

OM group SITE3 provides one tuple per office

**Key field:**

SITE\_INDEX

**Info field:**

SITE\_MODULE\_COUNT

**OM group SITE3** (continued)

---

**Associated OM groups**

SITE and SITE2 count the number of DTSRs.

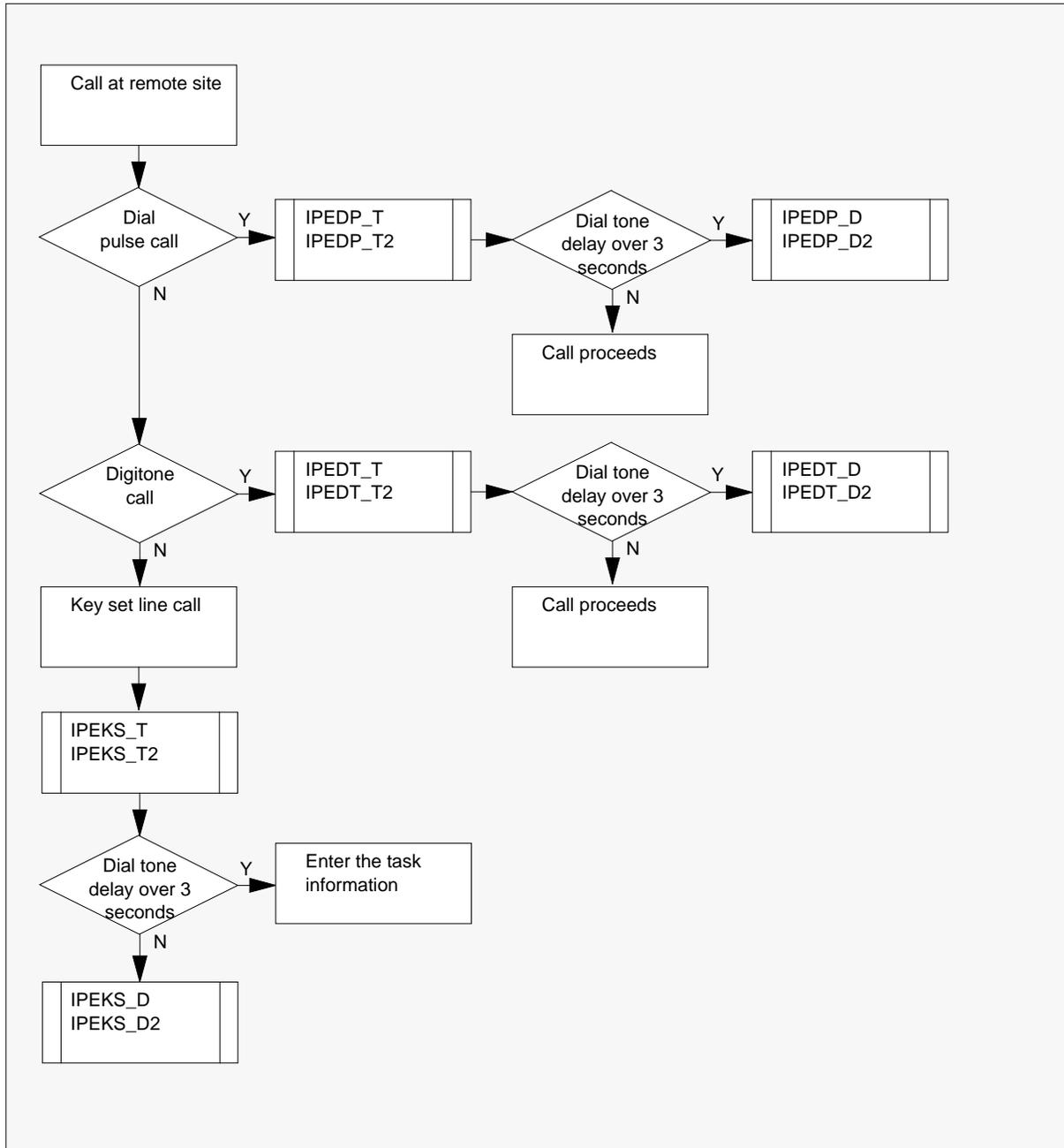
**Associated functional groups**

The following functional groups are associated with OM group SITE3:

- Meridian SL-100
- DMS-100
- Meridian Digital Centrex

## OM group SITE3 (continued)

### OM group SITE3 registers



### Register IPEDP\_T

Intelligent Peripheral Equipment (IPE) Dial Pulse (DP) total

IPEDP\_T counts the number of DTSR calls sampled on IPE DP lines.

---

**OM group SITE3** (continued)

---

**Register IPEDP\_T release history**

IPEDP\_T and IPEDP\_T2 were introduced in BCS32.

**Associated registers**

None

**Associated logs**

None

**Extension registers**

IPEDP\_T2

**Register IPEDP\_D**

IPE DP delay

IPEDP\_D counts the number of DTSR calls sampled on IPE DP lines when the dial tone delay is more than 3 seconds.

**Register IPEDP\_D release history**

IPEDP\_D and IPEDP\_D2 were introduced in BCS32.

**Associated registers**

None

**Associated logs**

None

**Extension registers**

IPEDP\_D2

**Register IPEDT\_T**

IPE Digitone (DT) total

IPEDT\_T counts the number of DTSR calls sampled on IPE DT lines.

**Register IPEDT\_T release history**

IPEDT\_T and IPEDT\_T2 were introduced in BCS32.

**Associated registers**

None

**Associated logs**

None

**OM group SITE3** (continued)

---

**Extension registers**

IPEDT\_T2

**Register IPEDT\_D**

IPE DT delay

IPEDT\_D counts the total number of DTSR calls sampled on IPE DT lines when the dial tone delay is more than 3 seconds.

**Register IPEDT\_D release history**

IPEDT\_D and IPEDT\_D2 were introduced in BCS32.

**Associated registers**

None

**Associated logs**

None

**Extension registers**

IPEDT\_D2

**Register IPEKS\_T**

IPE Key Set (KS) total

IPEKS\_T counts the number of DTSR calls sampled on IPE KS lines.

**Register IPEKS\_T release history**

IPEKS\_T and IPEKS\_T2 were introduced in BCS32.

**Associated registers**

None

**Associated logs**

None

**Extension registers**

IPEKS\_T2

**Register IPEKS\_D**

IPE KS delay

IPEKS\_D counts the number of DTSR calls sampled on IPE KS lines when the dial tone delay is more than 3 seconds.

**OM group SITE3 (end)**

---

**Register IPEKS\_D release history**

IPEKS\_D and IPEKS\_D2 were introduced in BCS32.

**Associated registers**

None

**Associated logs**

None

**Extension registers**

IPEKS\_D2

## OM group VOW

---

### OM description

The OM group VOW tracks the use of Virtual Office Worker (VOW) functionality.

The VOW feature allows telecommuters who do not have dedicated physical phone sets to access their dedicated DN from any of a predesignated group of phone sets. Once logged in, all calls to the dedicated DN terminate to the set on which the login occurred.

The VOW group measures the following events:

- successful login
- successful login through CKLN/CLN
- successful logout
- successful logout through CKLN/CLN
- successful logout through audit process
- successful passcode change
- invalid login attempt
- invalid logout attempt
- invalid passcode change attempt

### Release history

OM group VOW was introduced in MSL10.

### Registers

The following OM group VOW registers display on the MAP terminal:

INPASS	INFAIL	OUTPASS	OUTFAIL
CINPASS	CINFAIL	COUPASS	COUFAIL
PCCPASS	PCCFAIL	AUDPASS	AUDFAIL
ROUTPASS	ROUTFAIL		

### Group structure

OM group VOW

**Key field:**  
CUSTOMER\_GROUP

---

**OM group VOW** (continued)

---

**Info field:**

NIL\_TYPE\_ID

**Tuples:**

1

Table VOWINV is used to store data associated with VOW functionality. It contains the physical or virtual LEN(s) associated with a VOW's dedicated DN and associated data, the VOW's personal ID code, and the VOW's primary DN. As VOWs log in and log out of their dedicated DNs, this table is automatically updated to keep the information up-to-date. VOWINV also contains information identifying the physical sets which have the VOWDN line option assigned.

**Associated OM groups**

No OM groups are associated with this group.

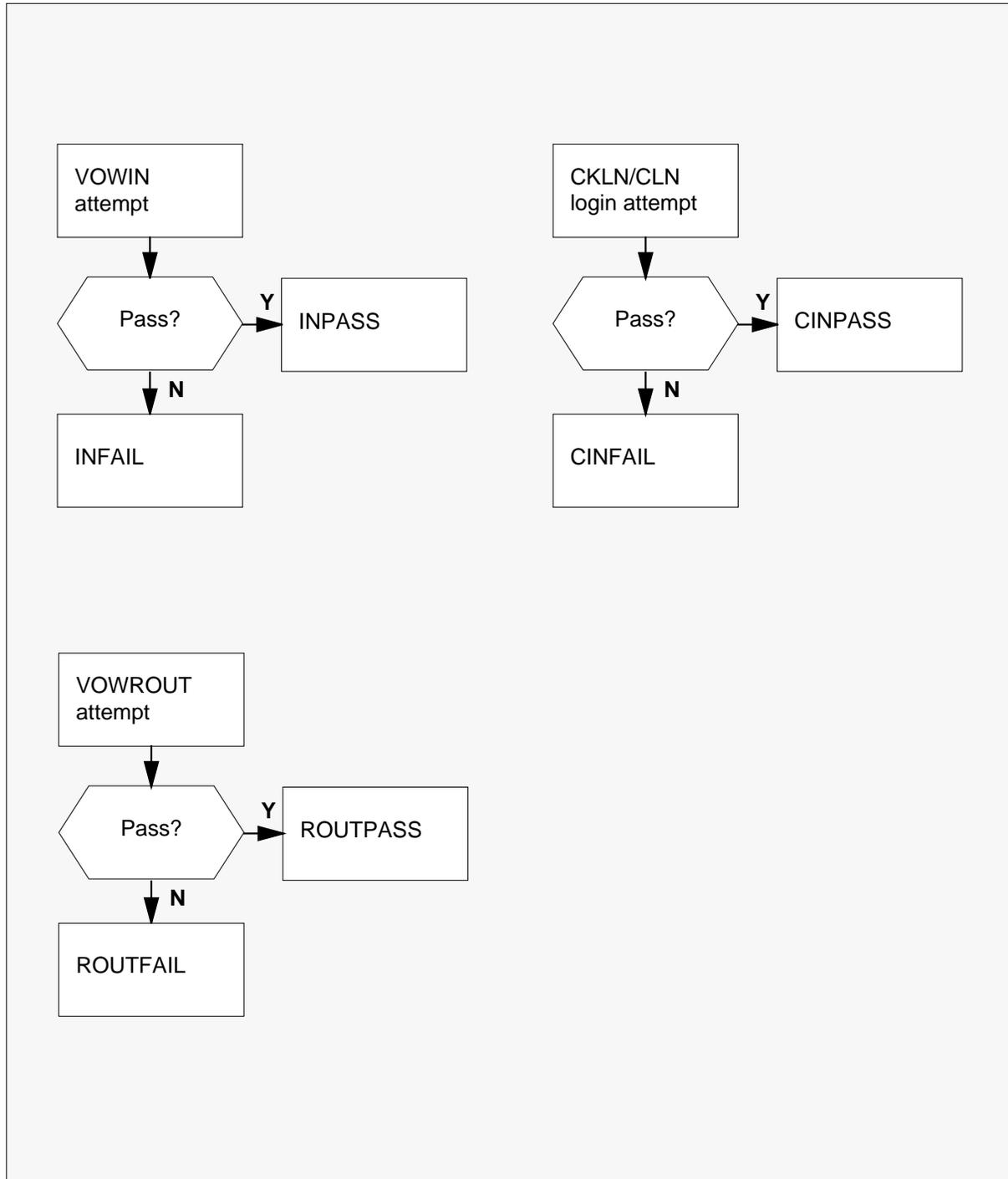
**Associated functional groups****Associated functionality codes**

The functionality codes associated with OM group VOW are shown in the following table.

Functionality	Code
MSL Virtual Office Worker	MSL00007

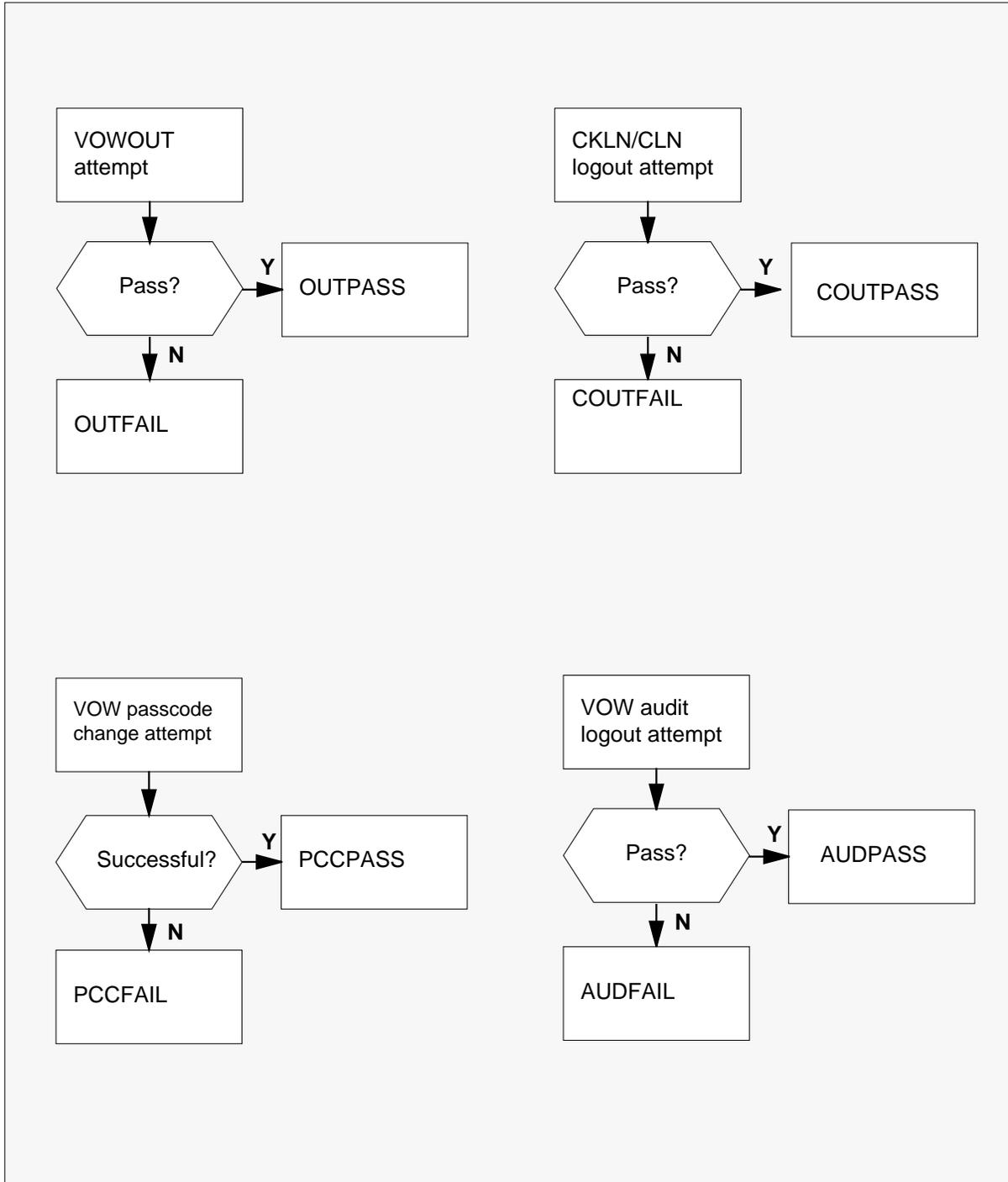
## OM group VOW (continued)

### OM group VOW registers



**OM group VOW** (continued)

**OM group VOW registers**



## **OM group VOW** (continued)

---

### **Register INPASS**

VOWIN pass (INPASS)

Register INPASS counts the number of successful login attempts made through the VOWIN access code. It is used in association with register INFALL. Together, registers INPASS and INFALL account for the total number of VOWIN login attempts.

#### **Register INPASS release history**

Register INPASS was introduced in MSL10.

#### **Associated registers**

This register is associated with register INFALL.

#### **Associated logs**

This register is associated with log report VOW501. The log report is generated when a successful VOWIN login attempt occurs.

#### **Extension registers**

There are no extension registers.

### **Register INFALL**

VOWIN fail (INFALL)

Register INFALL counts the number of failed login attempts made through the VOWIN access code. It is used in association with register INPASS. Together, registers INPASS and INFALL account for the total number of VOWIN login attempts.

#### **Register INFALL release history**

Register INFALL was introduced in MSL10.

#### **Associated registers**

This register is associated with register INPASS.

#### **Associated logs**

This register is associated with log report VOW502. The log report is generated when a failed VOWIN login attempt occurs.

#### **Extension registers**

There are no extension registers.

---

**OM group VOW** (continued)

---

**Register OUTPASS**

VOWOUT pass (OUTPASS)

Register OUTPASS counts the number of successful logout attempts made through the VOWOUT access code. It is used in association with register OUTFAIL. Together, registers OUTPASS and OUTFAIL account for the total number of VOWOUT logout attempts.

**Register OUTPASS release history**

Register OUTPASS was introduced in MSL10.

**Associated registers**

This register is associated with register OUTFAIL.

**Associated logs**

This register is associated with log report VOW501. The log report is generated when a successful VOWOUT logout attempt occurs.

**Extension registers**

There are no extension registers.

**Register OUTFAIL**

VOWOUT fail (OUTFAIL)

Register OUTFAIL counts the number of failed logout attempts made through the VOWOUT access code. It is used in association with register OUTPASS. Together, registers OUTPASS and OUTFAIL account for the total number of VOWOUT logout attempts.

**Register OUTFAIL release history**

Register OUTFAIL was introduced in MSL10.

**Associated registers**

This register is associated with register OUTPASS.

**Associated logs**

This register is associated with log report VOW502. The log report is generated when a failed VOWOUT logout attempt occurs.

**Extension registers**

There are no extension registers.

## **OM group VOW** (continued)

---

### **Register CINPASS**

VOW CKLN/CLN login pass (CINPASS)

Register CINPASS counts the number of failed VOW login attempts made through Change Keypad LEN/Change LEN (CKLN/CLN). It is used in association with register CINFALL. Together, registers CINPASS and CINFALL account for the total number of VOW login attempts made through CKLN/CLN.

#### **Register CINPASS release history**

Register CINPASS was introduced in MSL10.

#### **Associated registers**

This register is associated with register CINFALL.

#### **Associated logs**

This register is associated with log report VOW501. The log report is generated when a successful VOW login attempt through CKLN/CLN occurs.

#### **Extension registers**

There are no extension registers.

### **Register CINFALL**

VOW CKLN/CLN login fail (CINFALL)

Register CINFALL counts the number of failed VOW logout attempts made through CKLN/CLN. It is used in association with register CINPASS. Together, registers CINPASS and CINFALL account for the total number of VOW logout attempts made through CKLN/CLN.

#### **Register CINFALL release history**

Register CINFALL was introduced in MSL10.

#### **Associated registers**

This register is associated with register CINPASS.

#### **Associated logs**

This register is associated with log report VOW502. The log report is generated when a failed VOW logout attempt through CKLN/CLN occurs.

#### **Extension registers**

There are no extension registers.

---

**OM group VOW** (continued)

---

## **Register COUTPASS**

VOW CKLN/CLN logout pass (COUTPASS)

Register COUTPASS counts the number of successful VOW logout attempts made through CKLN/CLN. It is used in association with register COUTFAIL. Together, registers COUTPASS and COUTFAIL account for the total number of VOW logout attempts made through CKLN/CLN.

### **Register COUTPASS release history**

Register COUTPASS was introduced in MSL10.

### **Associated registers**

This register is associated with register COUTFAIL.

### **Associated logs**

This register is associated with log report VOW501. The log report is generated when a successful VOW logout attempt through CKLN/CLN occurs.

### **Extension registers**

There are no extension registers.

## **Register COUTFAIL**

VOW CKLN/CLN logout fail (COUTFAIL)

Register COUTFAIL counts the number of failed VOW logout attempts made through CKLN/CLN. It is used in association with register COUTPASS. Together, registers COUTPASS and COUTFAIL account for the total number of VOW logout attempts made through CKLN/CLN.

### **Register COUTFAIL release history**

Register COUTFAIL was introduced in MSL10.

### **Associated registers**

This register is associated with register COUTPASS.

### **Associated logs**

This register is associated with log report VOW502. The log report is generated when a failed VOW logout attempt through CKLN/CLN occurs.

### **Extension registers**

There are no extension registers.

## **OM group VOW** (continued)

---

### **Register PCCPASS**

VOW passcode change pass (PCCPASS)

Register PCCPASS counts the number of successful passcode change attempts made through the VOWPCC access code. It is used in association with register PCCFAIL. Together, registers PCCPASS and PCCFAIL account for the total number of VOWPCC attempts.

#### **Register PCCPASS release history**

Register PCCPASS was introduced in MSL10.

#### **Associated registers**

This register is associated with register PCCFAIL.

#### **Associated logs**

This register is associated with log report VOW501. The log report is generated when a successful VOWPCC attempt occurs.

#### **Extension registers**

There are no extension registers.

### **Register PCCFAIL**

VOW passcode change fail (PCCFAIL)

Register PCCFAIL counts the number of failed passcode change attempts made through the VOWPCC access code. It is used in association with register PCCPASS. Together, registers PCCPASS and PCCFAIL account for the total number of VOWPCC attempts.

#### **Register PCCFAIL release history**

Register PCCFAIL was introduced in MSL10.

#### **Associated registers**

This register is associated with register PCCPASS.

#### **Associated logs**

This register is associated with log report VOW502. The log report is generated when a failed VOWPCC attempt occurs.

#### **Extension registers**

There are no extension registers.

---

**OM group VOW** (continued)

---

**Register AUDPASS**

VOW audit logout pass (AUDPASS)

Register AUDPASS counts the number of successful VOW logout attempts made by the VOW audit. It is used in association with register AUDFAIL. Together, registers AUDPASS and AUDFAIL account for the total number of VOW logout attempts made by the VOW audit.

**Register AUDPASS release history**

Register AUDPASS was introduced in MSL10.

**Associated registers**

This register is associated with register AUDFAIL.

**Associated logs**

This register is associated with the following log reports:

- VOW501 is generated when a successful VOW logout attempt made by the VOW audit occurs
- VOW601 is generated when the VOW audit is complete

**Extension registers**

There are no extension registers.

**Register AUDFAIL**

VOW audit logout fail (AUDFAIL)

Register AUDFAIL counts the number of failed VOW logout attempts made by the VOW audit. It is used in association with register AUDPASS. Together, registers AUDPASS and AUDFAIL account for the total number of VOW logout attempts made by the VOW audit.

**Register AUDFAIL release history**

Register AUDFAIL was introduced in MSL10.

**Associated registers**

This register is associated with register AUDPASS.

## OM group VOW (continued)

---

### Associated logs

This register is associated with the following log reports:

- VOW502 is generated when a failed VOW logout attempt made by the VOW audit occurs
- VOW601 is generated when the VOW audit is complete.

### Extension registers

There are no extension registers.

## Register ROUTPASS

VOWROUT pass (ROUTPASS)

Register ROUTPASS counts the number of successful remote logout attempts made through the VOWROUT access code. It is used in association with register ROUTFAIL. Together, registers ROUTPASS and ROUTFAIL account for the total number of VOWROUT attempts.

### Register ROUTPASS release history

Register ROUTPASS was introduced in MSL10.

### Associated registers

This register is associated with register ROUTFAIL.

### Associated logs

This register is associated with log report VOW501. The log report is generated when a successful VOWROUT attempt occurs.

### Extension registers

There are no extension registers.

## Register ROUTFAIL

VOWROUT fail (ROUTFAIL)

Register ROUTFAIL counts the number of failed remote logout attempts made through the VOWROUT access code. It is used in association with register ROUTPASS. Together, registers ROUTPASS and ROUTFAIL account for the total number of VOWROUT attempts.

### Register ROUTFAIL release history

Register ROUTFAIL was introduced in MSL10.

**OM group VOW** (end)

---

**Associated registers**

This register is associated with register ROUTPASS.

**Associated logs**

This register is associated with log report VOW502. The log report is generated when a failed VOWROUT attempt occurs.

**Extension registers**

There are no extension registers.

## OM group WIDEBAND

---

### OM description

Wideband

WIDEBAND counts the number of wideband call attempts on PRI trunks. There are 23 different wideband possibilities defined by  $n \times 64$  kbytes, where the value of  $n$  is 2 to 24. For each wideband call attempt, the appropriate WBAT $n$  register is incremented.

*Note:* Register WBAT1 is not used.

### Release history

OM group WIDEBAND was introduced in BCS34.

#### BCS36

Registers TWBINTRA, TWBINTER, and TWBSWTCH are added. In the initial release of MSL-100 DWS, TWBINTRA and TWBINTER registers are not used.

#### BCS35

Registers TWBCONNT, TWBFAIL, TWBATB, and TWBGLR are added for new measurements.

### Registers

OM group WIDEBAND registers display on the MAP terminal as follows:

TWBATMPT	TWBCONNT	WBAT2	WBAT3
WBAT4	WBAT5	WBAT6	WBAT7
WBAT8	WBAT9	WBAT10	WBAT11
WBAT12	WBAT13	WBAT14	WBAT15
WBAT16	WBAT17	WBAT18	WBAT19
WBAT20	WBAT21	WBAT22	WBAT23
WBAT24	TWBFAIL	TWBATB	TWBGLR
TWBSWTCH	TWBINTER	TWBINTRA	TNBLOCK

### Group structure

OM group WIDEBAND provides one tuple per office.

#### Key field:

None

---

**OM group WIDEBAND** (continued)
 

---

**Info field:**

None

**Associated OM groups**

None

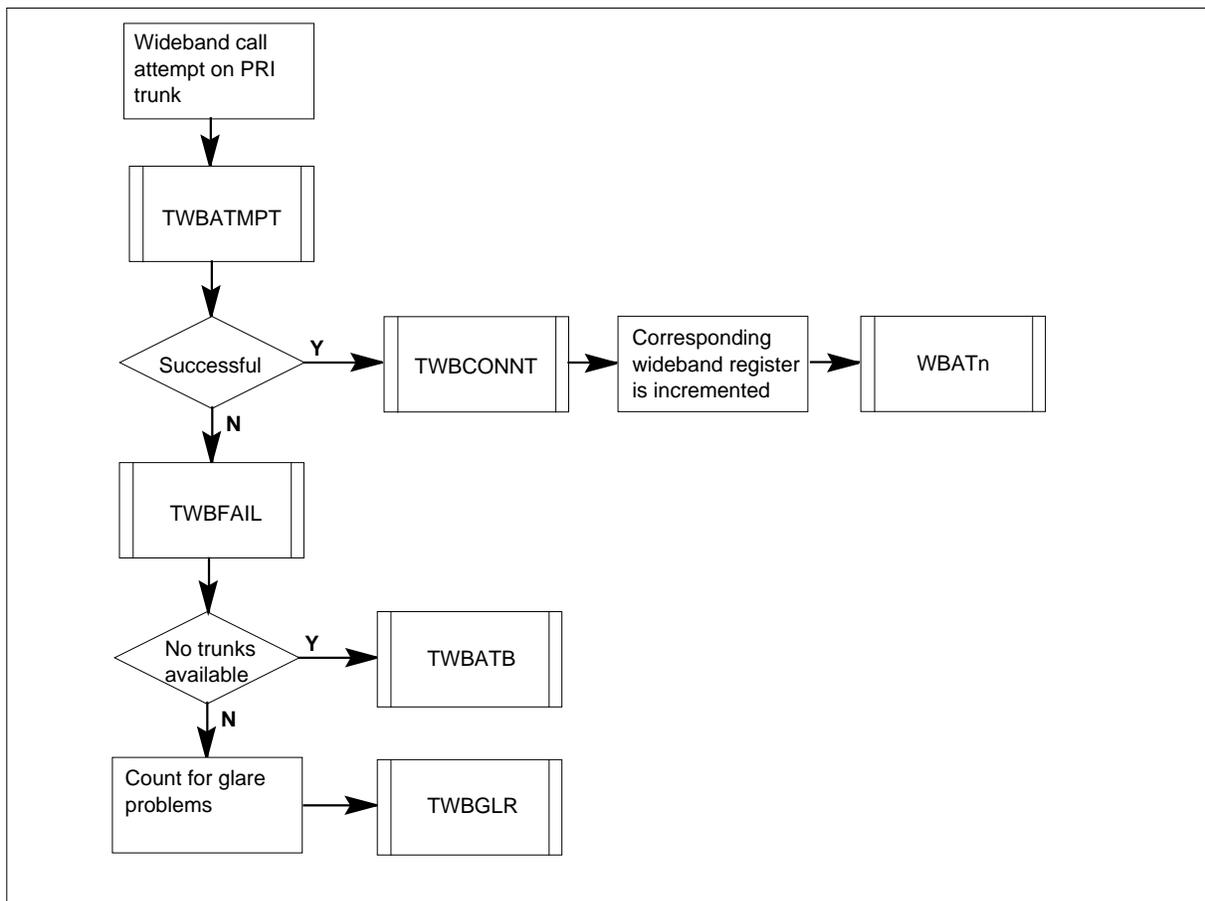
**Associated functional groups**

The following functional groups are associated with OM group WIDEBAND:

- LEC wideband

**Associated functionality codes**

The functionality code associated with OM group WIDEBAND is NI000004  
NI0 NI-2 DWS.

**OM group WIDEBAND registers**

## **OM group WIDEBAND** (continued)

---

### **Register TNBLOCK**

Total number blocked

TNBLOCK counts the total number of narrowband calls that are blocked from originating or terminating on a DWS ISUP IT or ISUP ATC trunk group due to option BLOCKNB having been selected.

#### **Associated registers**

None

#### **Associated logs**

None

### **Register TWBATB**

Total wideband call attempts blocked

TWBATB counts the total number of wideband calls rejected due to no trunks available.

#### **Register TWBATB release history**

TWBATB was introduced in BCS35.

#### **Associated registers**

None

#### **Associated logs**

None

### **Register TWBATMPT**

Total wideband call attempts

TWBATMPT counts the total number of wideband call attempts, regardless of type.

#### **Register TWBATMPT release history**

TWBATMPT was introduced in BCS34.

---

**OM group WIDEBAND** (continued)

---

**Associated registers**

WBAT2 through WBAT24

TWBATMPT = the sum of all WBATn

**Associated logs**

None

**Register TWBCONNT**

Total wideband call connections

TWBCONNT counts the number of successful wideband call connections.

**Register TWBCONNT release history**

TWBCONNT was introduced in BCS35.

**Associated registers**

TWBATMPT counts the total number of wideband attempts, regardless of type.

TWBFALL counts the number of wideband attempts that fail.

$TWBCONNT = TWBATMPT - TWBFALL$

**Associated logs**

None

**Register TWBFALL**

Total wideband call failures

TWBFALL counts the total number of wideband call attempts that fail.

**Register TWBFALL release history**

TWBFALL was introduced in BCS35.

**Associated registers**

TWBATMPT counts the total number of wideband attempts, regardless of type.

TWBCONNT counts the number of successful wideband call connections.

$TWBFALL = TWBATMPT - TWBCONNT$

## **OM group WIDEBAND** (continued)

---

### **Associated logs**

None

### **Register TWBGLR**

Total wideband call glare problems

TWBGLR counts the number of wideband calls that encounter glare problems. Glare occurs when different users seize both ends of a line or trunk simultaneously. These calls may still complete through route advance.

### **Register TWBGLR release history**

TWBGLR was introduced in BCS35.

### **Associated registers**

None

### **Associated logs**

None

### **Register TWBINTER**

Total number of wideband interLATA call attempts. In the initial release of MSL-100 DWS, this register is not used.

TWBINTER is incremented for each wideband interLATA call attempt.

### **Register TWBINTER release history**

TWBINTER was introduced in BCS36.

### **Associated registers**

None

### **Associated logs**

None

### **Register TWBINTRA**

Total number of wideband intraLATA call attempts. In the initial release of MSL-100 DWS, this register is not used.

TWBINTRA is incremented for each wideband intraLATA call attempt.

### **Register TWBINTRA release history**

TWBINTRA was introduced in BCS36.

---

**OM group WIDEBAND** (continued)

---

**Associated registers**

None

**Associated logs**

None

**Register TWBSWTCH**

Total number of wideband intraswitch call attempts

TWBSWTCH is incremented for each wideband intraswitch call attempt.

**Register TWBSWTCH release history**

TWBSWTCH was introduced in BCS36.

**Associated registers**

None

**Associated logs**

None

**Register WBAT2** $2 \times 64$  kbyte wideband call attemptsWBAT2 is incremented for each  $2 \times 64$  kbyte wideband call attempt.**Register WBAT2 release history**

WBAT2 was introduced in BCS34.

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT3** $3 \times 64$  kbyte wideband call attemptsWBAT3 is incremented for each  $3 \times 64$  kbyte wideband call attempt.**Register WBAT3 release history**

WBAT3 was introduced in BCS34.

## **OM group WIDEBAND** (continued)

---

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT4**

4 × 64 kbyte wideband call attempts

WBAT4 is incremented for each 4 × 64 kbyte wideband call attempt.

### **Register WBAT4 release history**

WBAT4 was introduced in BCS34.

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT5**

5 × 64 kbyte wideband call attempts

WBAT5 is incremented for each 5 × 64 kbyte wideband call attempt.

### **Register WBAT5 release history**

WBAT5 was introduced in BCS34.

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT6**

6 × 64 kbyte wideband call attempts

WBAT6 is incremented for each 6 × 64 kbyte wideband call attempt.

### **Register WBAT6 release history**

WBAT6 was introduced in BCS34.

---

**OM group WIDEBAND** (continued)

---

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT7** $7 \times 64$  kbyte wideband call attemptsWBAT7 is incremented for each  $7 \times 64$  kbyte wideband call attempt.**Register WBAT7 release history**

WBAT7 was introduced in BCS34.

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT8** $8 \times 64$  kbyte wideband call attemptsWBAT8 is incremented for each  $8 \times 64$  kbyte wideband call attempt.**Register WBAT8 release history**

WBAT8 was introduced in BCS34.

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT9** $9 \times 64$  kbyte wideband call attemptsWBAT9 is incremented for each  $9 \times 64$  kbyte wideband call attempt.**Register WBAT9 release history**

WBAT9 was introduced in BCS34.

## **OM group WIDEBAND** (continued)

---

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT10**

10 × 64 kbyte wideband call attempts

WBAT10 is incremented for each 10 × 64 kbyte wideband call attempt.

### **Register WBAT10 release history**

WBAT10 was introduced in BCS34.

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT11**

11 × 64 kbyte wideband call attempts

WBAT11 is incremented for each 11 × 64 kbyte wideband call attempt.

### **Register WBAT11 release history**

WBAT11 was introduced in BCS34.

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT12**

12 × 64 kbyte wideband call attempts

WBAT12 is incremented for each 12 × 64 kbyte wideband call attempt.

### **Register WBAT12 release history**

WBAT12 was introduced in BCS34.

---

**OM group WIDEBAND** (continued)

---

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT13**

13 × 64 kbyte wideband call attempts

WBAT13 is incremented for each 13 × 64 kbyte wideband call attempt.

**Register WBAT13 release history**

WBAT13 was introduced in BCS34.

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT14**

14 × 64 kbyte wideband call attempts

WBAT14 is incremented for each 14 × 64 kbyte wideband call attempt.

**Register WBAT14 release history**

WBAT14 was introduced in BCS34.

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT15**

15 × 64 kbyte wideband call attempts

WBAT15 is incremented for each 15 × 64 kbyte wideband call attempt.

**Register WBAT15 release history**

WBAT15 was introduced in BCS34.

## **OM group WIDEBAND** (continued)

---

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT16**

16 × 64 kbyte wideband call attempts

WBAT16 is incremented for each 16 × 64 kbyte wideband call attempt.

### **Register WBAT16 release history**

WBAT16 was introduced in BCS34.

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT17**

17 × 64 kbyte wideband call attempts

WBAT17 is incremented for each 17 × 64 kbyte wideband call attempt.

### **Register WBAT17 release history**

WBAT17 was introduced in BCS34.

### **Associated registers**

TWBATMPT

### **Associated logs**

None

## **Register WBAT18**

18 × 64 kbyte wideband call attempts

WBAT18 is incremented for each 18 × 64 kbyte wideband call attempt.

### **Register WBAT18 release history**

WBAT18 was introduced in BCS34.

---

**OM group WIDEBAND** (continued)

---

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT19**

19 × 64 kbyte wideband call attempts

WBAT19 is incremented for each 19 × 64 kbyte wideband call attempt.

**Register WBAT19 release history**

WBAT19 was introduced in BCS34.

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT20**

20 × 64 kbyte wideband call attempts

WBAT20 is incremented for each 20 × 64 kbyte wideband call attempt.

**Register WBAT20 release history**

WBAT20 was introduced in BCS34.

**Associated registers**

TWBATMPT

**Associated logs**

None

**Register WBAT21**

21 × 64 kbyte wideband call attempts

WBAT21 is incremented for each 21 × 64 kbyte wideband call attempt.

**Register WBAT21 release history**

WBAT21 was introduced in BCS34.

## OM group WIDEBAND (continued)

---

### Associated registers

TWBATMPT

### Associated logs

None

## Register WBAT22

22 × 64 kbyte wideband call attempts

WBAT22 is incremented for each 22 × 64 kbyte wideband call attempt.

### Register WBAT22 release history

WBAT22 was introduced in BCS34.

### Associated registers

TWBATMPT

### Associated logs

None

## Register WBAT23

23 × 64 kbyte wideband call attempts

WBAT23 is incremented for each 23 × 64 kbyte wideband call attempt.

### Register WBAT23 release history

WBAT23 was introduced in BCS34.

### Associated registers

TWBATMPT

### Associated logs

None

## Register WBAT24

24 × 64 kbyte wideband call attempts

WBAT24 is incremented for each 24 × 64 kbyte wideband call attempt.

### Register WBAT24 release history

WBAT24 was introduced in BCS34.

**OM group WIDEBAND** (continued)**Associated registers**

TWBATMPT

**Associated logs**

None

**DWS performance factors**

DWS performance factors are the individual components of overall performance of DWS. Performance factors indicate how well the DWS hardware and software fulfill the purpose for which they are designed. Performance is measured by indicators such as OMs. Performance factors include:

- *grade of service*, which is a measurement of the calls blocked. It is calculated by counting overflowed (or all trunks busy) calls and dividing that by the number of attempts made during the study interval.
- *glare*, which occurs when a call is dropped because the circuits seized were also seized at the other end of the trunk. It is directly measured.
- *call failures*, which occur when software or hardware errors cause a call to drop without a valid disconnect sequence. They are directly measured.

The DWS performance factors are listed along with their associated OM groups.

<b>Performance factors</b>	<b>OM groups</b>
Wideband traffic	WIDEBAND and TRK
Grade of service	WIDEBAND
Glare	WIDEBAND
Percentage of call failures	WIDEBAND

**Monitoring DWS performance factors**

The following procedure explains how to create and execute a procedure to monitor the performance of DWS.

## OM group WIDEBAND (continued)

---

### *Creating a DWS performance monitoring procedure*

1. *Select the appropriate performance indicators.*

The operational measurement registers defined at the beginning of this section are performance indicators.

2. *Activate the performance indicators.*

After choosing the appropriate measurement options, activate them in the switch and collect the outputs. To set up OMs and route OM reports to output devices, refer to the procedures in *Basic Administration Procedures*, 297-1001-300.

The following parameters are required to set up OMs:

- class names and register assignments
- data collection schedules
- reporting schedules
- output devices

3. *Analyze the results.*

Review the output associated with the OMs reported in accordance with the reporting schedules set up in the previous step by:

- looking for service indicators that exceed the established engineering criteria for DWS
- looking for service indicators that may indicate a maintenance or datafill problem
- capturing the appropriate OM readings that project when to add more facilities to continue meeting the engineering criteria

4. *Report the results.*

Notify the engineering and maintenance organizations of any service indications that require their attention.

### **DWS performance factor—wideband traffic**

Monitoring wideband traffic helps analyze trends for the bandwidth requested by end users and determines trunk requirements.

**OM group WIDEBAND** (continued)

The bandwidth preferred by end users impacts traffic engineering, as shown in the following table.

	<b>Switch A</b>	<b>Switch B</b>
Total number of calls	20	20
Number of 6 by 64 kbit/s calls	2	18
Number of 24 of 64 kbit/s calls	18	2
Number of DS-0s required	444 [(2×6)+(18×24)]	156 [(18×6)+(2×24)]

In switch A, most calls request a 24 by 64 kbit/s bandwidth, while the 6 by 64 kbit/s bandwidth is requested more often in switch B. As a result, 444 DS-0 channels are required in switch A compared to 156 in switch B. The impact on traffic engineering is obvious: more equipment is needed to handle 20 calls in switch A than to handle 20 calls in switch B.

Northern Telecom recommends that administrators convert wideband traffic into DS-0 units and use narrowband traffic engineering tables, preferably tables that can account for peaks. Because of high traffic growth, changing application mixes, and the fact that all DS-0s in a wideband call must reside on the same T1, administrators should add a safety margin of 20% to 30% initially. The following section describes the typical calculations used to evaluate wideband traffic.

Wideband traffic is monitored through the OM groups WIDEBAND and TRK. The following table shows the registers to be monitored. Refer to OM group TRK.

<b>Group</b>	<b>Register</b>	<b>Log reports</b>
WIDEBAND	TWBATMPT	None
	WBATn	None
TRK	NATTMPT	None

### How to evaluate wideband traffic

To identify trends for bandwidth requested by end users, monitor registers WBAT2 to WBAT24 and register TWBATMPT.

**OM group WIDEBAND** (continued)

---

**Calculations used to evaluate wideband traffic**

Use the following calculations to determine the relative percentage of total n by 64 kbit/s call attempts, for each value of n, where n=2 to 24.

$$\frac{WBATn}{TWBATMPT} \times 100 = \text{percentage of n by 64 kbit/s call attempts, where n = 2 to 24}$$

Using traffic engineering tables, Erlangs may be used to calculate the proper number of trunks required to carry the offered traffic at specific grades of service.

For narrowband traffic engineering, the following formula is used:

$$\text{number of calls} \times \text{average holding time (in hours)} = \text{Erlangs}$$

For wideband traffic engineering, the formula for narrowband is modified. The following formula is used:

$$\sum_{n=2}^{24} \text{number of calls (at bandwidth n)} \times \text{avg hold time (in hours at bandwidth n)} \times n = \text{Erlangs}$$

In the example on the following page, the table shows that 129 wideband calls were placed. If these calls had been narrowband, at an average holding time of 3 min (.05 h), the total Erlangs would be 6.45 (calculated using 129 X .05). According to narrowband traffic engineering tables, 13 DS-0 trunks—fewer than in one T1 link—are needed to handle 6.45 Erlangs with a blocking rate of 1%.

Wideband calls have different average holding times per bandwidth, as shown in the table on the following page. The total traffic for these calls is 397 Erlangs. According to narrowband traffic engineering tables, 528 DS-0 trunks (calculated using 422 trunks plus a 25% safety margin) are needed to handle 397 Erlangs, for a blocking rate of 1%. About 22 T1 trunks are thus needed.

The following example shows the impact of average holding time on wideband engineering. This example should be used as a reference only, since it will not be indicative of your traffic. It is provided to show the importance of

**OM group WIDEBAND** (continued)

understanding the holding times and distribution of bandwidth (that is, values of n) used.

**Impact of average holding time on wideband traffic engineering (Sheet 1 of 2)**

DS-0	DWS attempts	NATTMPT (Col 1 x Col 2)	Average holding time (hours)	Erlangs (Col 1 x Col 2 x Col 4)
Column 1	Column 2	Column 3	Column 4	Column 5
1	0	0	0	0
2	50	100	0.5	50
3	4	12	0.25	3
4	3	12	0.016	0.192
5	3	15	0.016	0.24
6	50	300	0.5	150
7	0	0	0	0
8	1	8	0.25	2
9	0	0	0	0
10	3	30	0.25	7.5
11	0	0	0	0
12	10	120	0.75	90
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	1	18	1	18
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0

**OM group WIDEBAND** (continued)**Impact of average holding time on wideband traffic engineering (Sheet 2 of 2)**

22	0	0	0	0
23	9	207	0.25	51.75
24	1	24	1	24
Total	129	708		397

The impact of the average holding time on traffic engineering shows that while less than one T1 is needed to handle 129 narrowband calls, 22 T1 links are needed to handle 129 wideband calls.

The registers in the OM group WIDEBAND are not measured on a trunk group basis but on a per office basis. Thus, when evaluating specific wideband trunk groups, administrators can only use the OM group WIDEBAND as a guide.

For OM group TRK, existing trunk usage OMs are recorded on each DS-0. For example, a narrowband call that lasts an entire hour generates 36 CCS (hundred call seconds). A wideband call that lasts an hour generates 36 CCS times the number of channels used in that call.

Peg counts in OM group TRK for wideband calls follow the same flow as for existing OM fields, and peg once regardless of the bandwidth of the call. For example, a narrowband call will peg NATTMP and CONNECT each time a call is completed. A similar wideband call, regardless of the number of channels used, will also peg these registers once per call.

Thus, the key registers of OM group TRK, when examining a wideband trunk, are NOVFLATB and TRU.

NOVFLATB indicates if any calls have overflowed the trunk group due to an insufficiency of trunks for offered traffic. If the value is zero, the number of trunks available was sufficient to meet the offered load. If the register is pegged, further investigation may need to be performed. On PRI trunks, if NOVFLATB is pegged, more access trunks may be required by the end user.

TRU provides a raw CCS count of traffic on the trunk group indicating how many of the DS-0s in that trunk group were being used for traffic. This count can be compared with traffic engineering tables to provide a view of the theoretical performance of the trunks. This value should be examined against actual overflow recorded by NOVFLATB. Traffic tables should take into consideration the probable peakedness of wideband traffic and the long holding times of videoconferencing - one of the main applications driving wideband traffic.

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**OM group WIDEBAND** (continued)
 

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In the previous example, if there were no call failures or all trunk busy conditions, registers NATTMT and INCATOT equal the total number of DS-0 attempts (708, column 3) and register TRU is the total traffic (397 Erlangs, column 5).

### DWS performance factor—grade of service

Monitoring grade of service helps ensure that the customer receives a high-quality service. The grade of service indicates the probability of a call attempt receiving a busy signal. Operating companies may use different grades of service; this document assumes the operating company is using a grade of service of 1%.

To determine the grade of service, monitor OM group WIDEBAND, registers TWBATMPT and TWBATB. TWBATMPT counts the number of times a wideband call is placed. TWBATB counts the number of times a wideband call is dropped because no trunks are available (all trunks busy).

Group	Register	Log reports
WIDEBAND	TWBATMPT	None
	TWBATB	None

### Calculations used to evaluate grade of service

Use the following calculation to determine the grade of service.

$$\frac{\text{TWBATB}}{\text{TWBATMPT}} \times 100 = \text{grade of service}$$

### Data evaluation procedure

Use the following procedure to evaluate grade of service.

#### *Evaluating grade of service*

1. Calculate the grade of service for the current study period.
2. If the grade of service is lower than 1%, go to step 4.
3. If the grade of service exceeds 1%, notify the provisioning engineers so corrective action can be taken.
4. You have completed this procedure.

---

**OM group WIDEBAND** (continued)
 

---

**DWS performance factor—glare**

Glare occurs when two ends of a trunk are seized at the same time. Glare is not desirable for wideband calls because cleaning up and reselecting multiple channels requires CPU resources and real time. The trunk selection algorithm is designed to prevent glare, so excessive glare indicates potential provisioning problems.

The OM group WIDEBAND measures the percentage of calls dropped because of glare. To evaluate glare, monitor registers TWBATMPT and TWBGLR. Register TWBATMPT counts the number of times a wideband call is placed. Register TWBGLR counts the number of times a wideband call is dropped because of glare.

Group	Register	Log reports
WIDEBAND	TWBATMPT	None
	TWBGLR	None

**Calculations used to evaluate glare**

Use the following formula to evaluate the percentage of blockage due to glare.

$$\frac{\text{TWBGLR}}{\text{TWBATMPT}} \times 100 = \text{percentage of blockage due to glare}$$

Ideally, there is no glare. A percentage of glare higher than 0 should be reported to maintenance personnel and provisioning engineers. This percentage may vary from one operating company to the other.

**Data evaluation procedure**

Use the following procedure to evaluate glare.

*Evaluating glare*

1. Calculate the percentage of glare for the current study period.
2. If the percentage of glare is zero, go to step 4.
3. If the percentage of glare is not zero, notify the provisioning engineers so corrective action can be taken.
4. You have completed this procedure.

**OM group WIDEBAND (end)****DWS performance factor—call failures**

Monitoring call failures helps ensure that the customer receives a high-quality service. A percentage of call failures higher than 1% should be reported to maintenance personnel and provisioning engineers. This percentage may vary from one operating company to the other.

To determine the percentage of call failures, monitor OM group WIDEBAND, registers TWBATMPT and TWBFAIL. TWBATMPT counts the wideband calls placed. TWBFAIL counts the number of times a wideband call is dropped.

Group	Register	Log reports
WIDEBAND	TWBATMPT	None
	TWBFAIL	None

**Calculations used to evaluate percentage of call failures**

Use the following calculation to determine the percentage of wideband call attempt failures.

$$\frac{\text{TWBFAIL}}{\text{TWBATMPT}} \times 100 = \text{percentage of call failures}$$

### **Data evaluation procedure**

Use the following procedure to evaluate percentage of call failures.

#### *Evaluating percentage of call failures*

1. Calculate the percentage of percentage of call failures for the current study period.
2. If the percentage of percentage of call failures is lower than 1%, go to step 4.
3. If the percentage of percentage of call failures exceeds 1%, notify the maintenance personnel and provisioning engineers so corrective action can be taken.
4. You have completed this procedure.



Meridian SuperNode  
**Commercial Systems**  
Operational Measurements Reference Manual

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Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant.

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules, and the radio interference regulations of the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense. Allowing this equipment to be operated in such a manner as to not provide for proper answer supervision is a violation of Part 68 of the FCC Rules, Docket No. 89-114, 55FR46066.

The MSL-100 system is certified by the Canadian Standards Association (CSA) with the Nationally Recognized Testing Laboratory (NRTL).

This equipment is capable of providing users with access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities is a violation of the Telephone Operator Consumer Service Improvement Act of 1990 and Part 68 of the FCC Rules.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

YEAR 2000 READINESS DISCLOSURE

This information was originally published prior to October 19, 1998. The foregoing legend applies retroactively in accordance with the U.S. Year 2000 Information and Readiness Act and on an ongoing basis.

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