CHAPTER **14**

Troubleshooting

This chapter contains troubleshooting information to help you to resolve situations that can occur during use of the ONS 15216 EDFA3. Sections in this chapter include:

14.1 LED Operation/Troubleshooting

The following material describes troubleshooting the ONS 15216 EDFA3 light-emitting diode (LED) display.

14.1.1 Power LED (Green)

The green power indicator LED on the front of the ONS 15216 EDFA3 illuminates constantly when both A and B electrical power feeds are connected and the voltage of each is within the acceptable range. The LED flashes if either of the two electrical power feeds is disconnected or if either feed is outside of the acceptable range.

If the green power indicator LED is flashing, complete the following procedure:

Step 1 Verify that both A and B electrical power feeds are connected to both the ONS 15216 EDFA3 and to a source of –48-VDC electrical power.

Step 2 If both electrical power feeds are connected to both the EDFA3 and to an electrical power source, complete one of the following:

- Use a voltmeter to measure the voltage between the power ("-48VDC") and ground ("return") contacts for both the A and B feeds.

- Issue the RTRV-EQPT command to read the voltage of Power Bus A and B. To verify, issue the RTRV-ALM-EQPT to see PWRBUSA and / or PWRBUSB alarms.

14.1.2 Fail LED (Red)

The red failure indicator LED on the front of the ONS 15216 EDFA3 illuminates if either the laser pump power or the bias current is out of range.

14.1.3 LOS (Loss of Signal) LED (Yellow)

The yellow loss of signal indicator LED on the front of the ONS 15216 EDFA3 illuminates when an optical loss of signal threshold is crossed. Verify loss of signal threshold values by logging into the EDFA3 and using the RTRV-TH-DWDM TL1 command.

Verify optical input power at the input (COM RX) port. If optical input power is below the threshold value, either the value of the threshold needs to be lowered (using the SET-TH-DWDM TL1 command) or the optical input power must be increased.

If optical input power is lower than expected, the cause could be any of the following:

- Dirty optical connectors
- Optical connectors not fully seated
- Worn/abused optical patch cords
- Poorly routed/pinched optical patch cords
- Excessive fiber span loss
- Excessive loss through other wavelength management devices (that is, multiplexer, OADM, etc.).

14.1.4 LED Sequence on Startup

When the ONS 15216 EDFA3 starts up, the following LED sequence occurs:

1. All LEDs illuminate, followed by a pause of approximately thirty seconds.

2. The green power indicator LED illuminates (the other LEDs are off), followed by a pause of approximately ten seconds.

3. All LEDs illuminate, followed by a pause of approximately twenty-five seconds.

4. The LEDs indicate the operational status of the ONS 15216 EDFA3 (for example, if there is a loss of signal, the yellow LOS LED will be illuminated).

14.2 Configuration File

Values in the configuration file are reset to manufacturer default values in the following cases:

- When a STA-LOCL-RST (reset equipment) command is issued by an administrative user
- When the administrative user deletes the configuration file
- When the configuration file is corrupted

Note When the configuration file is corrupted, an alarm DATAFLT is raised. As soon as a proper file has been loaded, the alarm is cleared. A checksum is performed on a replacement file to ensure that it is a valid file. The configuration file is in binary format.

The configuration file consists of two sections:

- Header (Example 14-1)
- configuration parameters (Example 14-2)

Example 14-1   Header Portion of the Configuration File

```
FileType=CISCO ONS 15216 EDFA3 Database File
Description=CISCO ONS 15216
ActiveSoftwareName=ONS 15216EDFA3-1.00.00-003L-12.23
NodeName=Monza
IP-Address=10.51.100.54
```

Example 14-2   Configuration Parameters Portion of the Configuration File

```
CTRLMODE
GAINSP
PWROFFSET
LINE1TXWRSP
LINE1TXWRTHFL
LINE1RXWRTHFL
LINE2RXWRTHFL
TILTSP
TILTOFFSET
OSRI
PWRBUSMODE
NAME
LONGITUDE
LATITUDE
DESCR
PWRBUSMIN
PWRBUSMAX
MAXCTMP
MINCTMP
```

When the configuration file is being backed up or restored, the ONS 15216 EDFA3 prevents any administrative operation that could change the current settings. To prevent attempts at making changes, a BACKUPREST alarm signals that the backup/restore operation is in progress and refuses all attempts to change settings. When the backup/restore is completed, the BACKUPREST alarm clears and configuration changes can be made.

14.3 Alarms

The following parameters are reported with an automatic alarm message:

- <almcde> indicates the severity of the automatic message. Table 14-1 reports the possible values.
- <date> indicates the date. The syntax is yyyy-mm-dd.
- <time> indicates the time. The syntax is hh-mm-ss.
- <ocrdat> Indicates the date (month-day) of the event occurrence. The format is MOY-DOM, where MOY stands for month of year and has a range of 1 to 12 and DOM stands for day of month and has a range of 1 to 31.
- <ocrtm> indicates the time (hour-minute-second) of the event occurrence. The format is HOD-MOH-SOM, where HOD stands for hour of day and has a range of 0 to 23, MOH stands for minute of hour and has a range of 0 to 59, and SOM stands for second of minute and has a range of 0 to 59.

Table 14-1   Alarm Code Descriptions

Alarm Code	Description
*C	Critical Alarm
**	Major Alarm
*^	Minor Alarm
A^	Automatic Message or No Alarm

Note   The General Block, unless clearly specified, is not supported and will be denied with an INUP error code.

14.4 Back Up Log File

The following procedure describes how to back up the Log file. Either the TL1 or the SNMP log files can be copied locally as a backup.

Step 1   To start an FTP session, make sure that you have RWA permission and issue the following command:

> **ftp** *server_ip_address*

for example, type:

> ftp 100.110.120.100

where 100.110.120.100 is the IP address of the host.

Step 2   Type **lcd** command to change to the local path where the log file is located, as follows:

> **lcd** *local path*

Step 3   The **get** command downloads a single file. Type:

get *log-file-name copy-file-name*

where the *log-file-name* is the file that you want to retrieve and *copy-file-name* is the name for the copy of the log file on your file system. The **get** command copies the remote file from the remote server to the local machine.

The filenames of the TL1 log files are:

- aologA.txt
- aologB.txt

The filenames of the Simple Network Management Protocol (SNMP) log files are:

- snmpNotifyLogA
- snmpNotifyLogB

Step 4   Log off the FTP session by typing **quit** at the FTP command line. This command disconnects the user from the remote server and exits the FTP shell.

14.5 Upload the Configuration File Using TL1

To replace the current copy of the configuration file, upload the configuration file from the PC to the ONS 15216 EDFA3 using the following procedure:

Step 1   Use the **ACT-USER** command to login as an RWA user.

Step 2   Start an FTP session, and issue the following command:

```
> ftp userid password server_ip_address
```

Step 3   Issue the following command:

```
COPY-RFILE:[<aid>]:<ctag>:TYPE=RFR, SRC=
"ftp://<userid>:<password>@<ftphost-ipaddres>:21/<file-path>/ONS15216DataBase",
DEST="file://fd1/ONS15216DataBase",OVERWRITE=YES
```

For example, if the configuration file ONS15216DataBase is saved in <home directory>:/EDFA3, then you would issue the command:

```
COPY-RFILE::123:TYPE=RFR,SRC="ftp://<userid>:<password>@<ftphost-ipaddres>:21/EDFA3/ONS
15216DataBase", DEST="file://fd1/ONS15216DataBase",OVERWRITE=YES;
```

Step 4   If the configuration file has been corrupted, a DATAFLT alarm is generated. In this case, repeat Step 3 to download a correct configuration file. The DATAFLT alarm will be cleared.

Step 5   Issue the command:

```
INIT-SYS::eqpt:123::1;
```

Step 6   The EDFA3 restarts, using the new configuration file.

14.6 No Optical Output from Amplifier

If there is no optical output from the amplifier, complete the following procedure:

Step 1 Verify that neither the LOS LED nor the Fail LED is illuminated.

If the LOS LED is illuminated, that condition must first be corrected before the amplifier will turn on.

Step 2 Verify that there is an optical path between the DC TX and DC RX ports.

If there is no path, establish one using a Dispersion Compensation Unit (DCU) with an insertion loss value of between 3 and 9 dB or an optical patch cord with a 3- to 9-dB attenuator.

14.7 No TL1 Alarms Raised as Expected

If no TL1 alarms are raised as expected, there are three possible causes:

- Alarms are inhibited.
- Alarms are downgradeable to NA/NR severity.
- Alarm is screened by a root alarm.

Step 1 To resolve inhibited alarms:

a. Verify that a TL1 user session is active.

b. Verify that all alarms are allowed by issuing the ALW-MSG-ALL TL1 command.

c. Issue the RTRV-ALM-ALL command to poll the EDFA3 for all current alarms.

Step 2 To resolve alarms that are downgradeable to NA/NR severity, issue the RTRV-ATTR-ALL command to see if the alarm has been downgraded. Then, upgrade the alarm severity using one of the following steps:

- If the alarm is dense wavelength division multiplexing (DWDM)-related, issue the SET-ATTR-DWDM command.
- If the alarm is equipment-related, issue the SET-ATTR-EQPT command.

Step 3 If the alarm is screened by a root alarm, issue the RTRV-ALM-ALL command to poll the existing alarms.

14.8 TL1 Session Cannot be Established

If a TL1 session cannot be established, complete the following procedure:

Step 1 Verify that the EDFA3 has finished the booting process. User sessions cannot be established until the booting process is complete.

Step 2 If logging in locally through the craft (nine-pin EIA/TIA-232 [RS-232]) port on the EDFA3, verify that the connection between the computer and the EDFA3 is made with a straight-through cable.

Step 3 Verify that the terminal emulation software (for example, HyperTerminal) settings on the user computer are set as follows: 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.

Step 4 Verify that the COM port selected by the terminal emulation software is the same one that is physically connected to the EDFA3.

Step 5 Proper connection can be verified by typing a semicolon. If the EDFA3 issues a response message, then connection has been properly established.

Step 6 If logging in remotely via the RJ-45 10/100 Ethernet port, first verify that network connectivity between the client (user) computer and the EDFA3 exists by issuing a ping command to the EDFA3's provisioned IP address.

Step 7 When using Telnet to establish a remote user session, ensure that port 3083 has been specified after the EDFA3's IP address ("Telnet 12.34.56.78 3083").

14.9 SNMP User Session Cannot be Established

If a SNMP user session cannot be established, complete the following procedure:

Step 1 Verify that the EDFA3 has finished the booting process. User sessions cannot be established until the booting process is complete.

Step 2 Verify that network connectivity between the client (user) computer and the EDFA3 exists by issuing a ping command to the EDFA3's provisioned IP address.

Step 3 Before an SNMP user session can be established, the IP address of the client (user) computer must first be entered into the EDFA3 as a trap destination by issuing the ENT-TRAPTABLE TL1 command.

Step 4 After the IP address for the SNMP client (user) computer has been entered, the MIBs for the EDFA3 must be present on that computer in order for an SNMP user session to be established.

14.10 Recover the Default Password

The following procedure can be used to reset the system password if it becomes corrupted or lost.

> **Note** This procedure erases all the users from memory and adds the default CISCO15 user-name with a blank password.

Step 1 Connect to the EIA/TIA-232 (RS-232) port.

Step 2 Open HyperTerminal (see the "5.3 Communicating with the EDFA3 Through a Serial EIA/TIA-232 (RS-232) Interface" section on page 5-4 for further details on the configuration).

Step 3 Power off the EDFA3 and power it back on.

Step 4 While the dots are present in the HyperTerminal window during the reboot process, press the tilde (~) key on the keyboard. You must see the following:

```
...~.......
User Recovery
>
```

Step 5 When the prompt (>) appears, type the command **recover** (in lower case) and press the ENTER key. The EDFA3 must respond with the word 'Completed'.

```
...~.......
User Recovery
>recover
Completed
>
```

Step 6 Type the command **exit** (in lower case) and press the ENTER key to get to the TL1 prompt. The EDFA3 must respond with the word 'start…' followed by the normal warning message for TL1.

```
...~.......
User Recovery
>recover
Completed
>exit
start...
WARNING
This system is restricted to authorized users for business purposes.
Unauthorized access is a violation of the law. This service may be monitored
for administrative and security reasons. By proceeding, you consent to this
monitoring.


>
```

✎

Note If you decide not to recover the password, type **exit** to get to the TL1 prompt.

14.11 Troubleshooting and Fault Clearing Procedures (Indexed by Alarm Message)

This section provides specific maintenance procedures to troubleshoot and clear faults based on the TL1 Autonomous message reported by the ONS 15216 EDFA3.

Alarms reported by the ONS 15216 EDFA3 utilize the TL1 messages REPT-ALM-EQPT and REPT-ALM-DWDM with the 'Condition Type' field indicating the specific fault.

These alarms are summarized in the table below.

Table 14-2 **TL1 Autonomous Alarms**

TL1 Autonomous Message	Condition Type (condtype)	Condition Descriptor (conddescr)	Access Identifier (aid)	Notification Code (ntfcncde)	Service Effect (sereff)
REPT ALM EQPT	PWRBUSA	Power Bus A Alarm	PWR-A	MN	NSA
REPT ALM EQPT	PWRBUSB	Power Bus B Alarm	PWR-B	MN	NSA
REPT ALM EQPT	MEMLOW	Free Memory on System Very Low	EQPT	MN	NSA
REPT ALM EQPT	FFSSLOW	Flash File System Capacity Very Low	EQPT	MN	NSA
REPT ALM EQPT	DATAFLT	Data Integrity Fault	EQPT	MJ	SA
REPT ALM EQPT	BACKUPREST	BackUp/Restore ConfFile In Progress	EQPT	MN	NSA
REPT ALM EQPT	SFTWDOWN	Software Download In Progress	EQPT	MN	NSA
REPT ALM EQPT	EQPT	Equipment Failure	EQPT	CR	SA
REPT ALM EQPT	COMFAIL	Module Communication Failure	EQPT	MN	NSA
REPT ALM EQPT	CTMP	Case Temperature Out Of Range	EQPT	MN	NSA
REPT ALM EQPT	FTMP	Fiber Temperature Out Of Range	EQPT	MN	NSA
REPT ALM EQPT	L1TMP	Excessive Pump 1 Temperature	EQPT	MN	NSA
REPT ALM EQPT	L1BIASD	Laser 1 Bias Degrade	EQPT	MN	NSA

Table 14-2 **TL1 Autonomous Alarms (continued)**

TL1 Autonomous Message	Condition Type (condtype)	Condition Descriptor (conddescr)	Access Identifier (aid)	Notification Code (ntfcncde)	Service Effect (sereff)
REPT ALM EQPT	L1BIASF	Laser 1 Bias Fail	EQPT	MJ	NSA
REPT ALM EQPT	L2TMP	Excessive Pump 2 Temperature	EQPT	MN	NSA
REPT ALM EQPT	L2BIASD	Laser 2 Bias Degrade	EQPT	MN	NSA
REPT ALM EQPT	L2BIASF	Laser 2 Bias Fail	EQPT	MJ	NSA
REPT ALM DWDM	LINE1RXPWRFL	Power Fail Low LINE1RX Port	1	CR	SA
REPT ALM DWDM	GAINDH	Gain Degrade High	1	MN	NSA
REPT ALM DWDM	GAINDL	Gain Degrade Low	1	MN	NSA
REPT ALM DWDM	LINE1TXPWRFL	Power Fail Low LINE1TX Port	1	CR	SA
REPT ALM DWDM	LINE1TXPWRDH	Power Degrade High LINE1TX Port	1	MN	NSA
REPT ALM DWDM	LINE1TXPWRDL	Power Degrade Low LINE1TX Port	1	MN	NSA
REPT ALM DWDM	LINE2RXPWRFL	Power Fail Low LINE2RX Port	1	CR	SA
REPT ALM DWDM	VOADH	VOA Degrade High	1	MN	NSA
REPT ALM DWDM	VOADL	VOA Degrade Low	1	MN	NSA
REPT ALM DWDM	VOAFH	VOA Fail High	1	CR	SA

For each of alarm CONDITION TYPES listed in the table above, the following sections provide specific maintenance procedures to troubleshoot and clear the fault indication.

14.11.1 PWRBUSA and PWRBUSB

The ONS15216 EDFA3 performs continuous monitoring on it's DC power source to insure that the input voltage remains within limits. The specific details of how this monitoring is performed depend on the POWER MODE for which the ONS 15216 has been configured.

As indicated in the installation section, the ONS 15216 EDFA3 can be configured for a single input power source from power bus A (**SIMPLEX** power mode) or redundant dual power inputs from both power bus A and power bus B (**DUPLEX** power mode).

In **SIMPLEX** power mode the system continuously monitors the DC input voltage on input power buss "A" and reports any faults (out-of-limits conditions) by generating the TL1 autonomous alarm message **REPT-ALM-EQPT** with the condition type field set to **PWRBUSA**.

In **DUPLEX** power mode, the system monitors buss "A" as noted above, and also continuously monitors the DC input voltage on power buss "B". Fault conditions on buss "B" are reported by generating the TL1 autonomous alarm message **REPT-ALM-EQPT** with the condition type field set to **PWRBUSB**.

In addition to the above autonomous messages, it is always possible to retrieve the current input power alarm state of the ONS 15216 EDFA3 by issuing the TL1 command **RTRV-ALM-EQPT:::123**; and noting the presence or absence of the **PWRBUSA** and **PWRBUSB** alarm conditions. This is useful to confirm that the alarm has been cleared when the problem is found.

The steps listed below can be used to trouble-shoot and clear a **PWRBUSA** or **PWRBUSB** fault indication.

Step (1) includes most common external power bus faults and the remaining steps cover less likely conditions which could also cause a **PWRBUSA** or **PWRBUSB** indication.

⚠

Warning   **Voltages might be present on the DC-input power supply terminals. Turn off the power source circuit breaker and remove the power supply before accessing the terminals.**

Here is the step-by-step procedure to clear a PWRBUSA or PWRBUSB alarm:

Step 1   **Check input supply voltages**
Normally the presence of a **PWRBUSA** or **PWRBUSB** alarm indicates a fault on the associated external power buss.

Possible causes include:

- Blown External Fuse or Tripped Circuit Breaker in the power distribution feeding the EDFA3 (note that there are no user serviceable fuses in EDFA3 itself)

- Fault or failure in the external AC/DC -48 volt Power Supply

- Discharged or defective battery (where equipped with battery backup)

- Loose screw terminal connection or bad crimped connection at power input

- Chafed or damaged insulation has caused short circuit (often accompanied by a blown fuse, tripped circuit breaker, or over-current shutdown in the external power supply)

Step 2   **Check PWRBUSMODE setting**
It is possible to cause a false **PWRBUSB** power alarm if the PWRBUSMODE parameter has not been set correctly. If the power mode is set incorrectly to **DUPLEX**, when only ONE power supply source is connected to buss "A", then buss "B" will show a constant **PWRBUSB** alarm. To check this, retrieve the current setting of the power mode by issuing the TL1 command **RTRV-EQPT::ALL:123**; and note the value returned for **PWRBUSMODE**.   This command will also return the voltage values being measured at power buss "A" and "B" input terminals as **POWERBUSAVAL**, and **POWERBUSBVAL**.

Step 3   **Check the input Power Buss Alarm Threshold set points**
Incorrect setting of the **PWRBUSMIN** or **PWRBUSMAX** alarm threshold set points could cause a false power alarm to be issued. To check for this, retrieve the current upper and lower voltage thresholds which the ONS 15216 EDFA3 is using to test for a DC input power alarm by issuing the TL1 command **RTRV-TH-EQPT::ALL:123**; Check that the values returned for **PWRBUSMIN**, and, **PWRBUSMAX** are reasonable. The actual input voltage can be retrieved by using the **RTRV-EQPT::ALL:123**; TL1 command. If the upper or lower limit values are set incorrectly too close to the normal input voltage, then false power alarms could be triggered. If this is the case, try returning to the default values of 40 for PWRBUSMIN and 57 for PWRBUSMAX using the **SET-TH-EQPT** TL1 command

Step 4   **Check for Alarm Circuit fault**
If all the above causes have been eliminated, it is possible that the internal voltage monitoring circuitry in the ONS 15216 EDFA3 has failed and is issuing a false alarm. To confirm this, compare the voltage values measured at the input power terminals with a known good external voltmeter with the values **POWERBUSAVAL** and **POWERBUSBVAL** retrieved using the **RTRV-EQPT::ALL:123** command in Step 2 above. The internal circuitry which performs voltage monitoring in the ONS 15216 EDFA3 is not field serviceable, so unit must be replaced if this is confirmed as the problem.

14.11.2 MEMLOW

This alarm condition indicates that the processor in the ONS 15216 EDFA3 has detected that it is low on MEMORY resources. Normally the system manages the allocation of memory automatically, so this condition indicates an abnormal condition has occurred in the software.

Here is the step-by-step procedure to clear the MEMLOW alarm condition.

Note   As noted in step 2 below, you must log in to the ONS 15216 with full administrative privileges in order to issue the INIT-SYS TL1 command. In an emergency a reset can be forced by power cycling the ONS 15216 EDFA3, but this is service affecting and should not be considered unless service has already been lost due to a secondary failure believed to be related to the MEMLOW condition.

Step 1   Make a note of any unique operational conditions or command sequences that you think may have contributed to, or triggered, the **MEMLOW** memory fault condition (if known). This information should be reported to Cisco so that the root cause of the MEMLOW condition can be properly investigated.

Step 2   Open a TL1 session and log into the ONS 15216 EDFA3 as ADMIN.

Step 3   Attempt to perform a warm restart of the ONS 15216 EDFA3 by issuing the TL1 command INIT-SYS command with the following parameters:

    INIT-SYS::EQPT:123::0;

This will reset and restart the ONS 15216 EDFA3 internal software using the current active code image (current default firmware version).

14.11.3 FFSSLOW

This alarm condition indicates that the internal Flash File System is nearly full. The Flash File System (FFS) fulfills the same role as the hard drive on a desktop PC by providing persistent storage that will retain data while the system is rebooted or power is cycled. Under normal conditions the system will not require user intervention to maintain the FFS because the internal logs, configuration data and code images that the system stores are budgeted at specific sizes that are well within the capacity of the FFS. The FFSSLOW condition can arise however when User operations using the CPY-MEM or COPY-RFILE write additional data to the FFS or an FTP operation transfers files to the FFS.

When the flash file system is full, commands which attempt to write data to the FFS will fail and issue a TL1 DENY response.

Caution   DELETING THE WRONG FILES WILL LEAVE THE SYSTEM UNBOOTABLE.

DO NOT DELETE the main database file: ONS15216DataBase

DO NOT DELETE the boot image files. The boot image file names are based on the version of the software, but are of the general form:ONS15216Edfa3_01.00.00_003L_12.23 where the numbers to the right of the word 'Edfa3' identify the version information. DO NOT DELETE ANY FILE THAT RESEMBLES THIS FORM WITHOUT CONTACTING CUSTOMER SUPPORT FOR

CLARIFICATION.

If not ABSOLUTLY SURE, do not delete anything.

Here is the step-by-step procedure to clear the FFSSLOW alarm condition.

Step 1   Open a TL1 session and log into the ONS 15216 EDFA3 as ADMIN.

Step 2   Use the TL1 command **RTRV-RFILE:::123;** to retrieve a directory of the flash file system and identify the USER created files which need to be deleted to free up space.

Step 3   If desired, back up the files that are to be deleted to a PC host or other server via FTP using the TL1 command **COPY-RFILE** with the copy TYPE set to **RFBU** and the destination set to the FTP address of the host where the files are to be saved.

Step 4   Using the TL1 command **DLT-RFILE** to delete ONLY the unneeded USER created files.

14.11.4 DATAFLT

This alarm condition indicates that the main configuration file transferred by COPY-RFILE with RFR option has been corrupted. This is not immediately service affecting because the system will continue to use the current working copy of the system configuration data which is resident in memory until power cycled, or reset with the INIT-SYS TL1 command.   The DATAFLT alarm will clear when a clean copy of the ONS15216DataBase file is transferred to the EDFA3.

⚠
Caution   Do not power cycle the ONS15216 EDFA3 or reset the system using an INIT-SYS command while it is in a DATAFLT alarm condition, or the configuration parameters will reset to default values, which will shut down the laser and interrupt service..

Here is the step-by-step procedure to clear the DATAFLT alarm condition.

Step 1   Use the TL1 command **COPY-RFILE** with the **TYPE=RFR** option to transfer a clean copy of the **ONS15216DataBase** file by FTP to replace the corrupted file. The exact format for the COPY-RFILE command is dependant of the location of the backup file which will be copied to the ONS 15216 EDFA3. Specifics on the use of the **COPY-RFILE** command can be found in the TL1 Command Reference section of this manual.

✎
Note   If a clean backup copy of the ONS15216DataBase file is not available for transfer via the LAN using the COPY-RFILE command, the EDFA3 can be forced back to factory defaults by issuing an INIT-SYS TL1 command, but, as noted in the caution above, this will cause an interruption in service until proper settings are manually reentered using the TL-1 interface

14.11.5 BACKUPREST

This alarm condition indicates that the system is in the process of transferring the database file using FTP protocol. During this operation the database is locked and this alarm condition is raised to prevent the file from being accessed while it is being updated.

No action necessary, the alarm should clear on its own when the backup/restore operation is completed.

14.11.6 SFTWDOWN

This alarm condition indicates that the system is in the process of transferring the code image file using FTP protocol. During this operation the file is locked and this alarm condition is raised.

No action necessary, the alarm should clear on its own when the backup/restore operation is completed.

14.11.7 EQPT

This alarm condition indicates that a serious internal fault has occurred, such as a complete loss of communications on a critical internal communication buss.

Step 1 Attempt to clear this alarm by using an **INIT-SYS** command to reset the ONS 15216 EDFA3 software.

Step 2 Attempt to clear this alarm by power cycling the ONS 15216 EDFA3.

Step 3 If the above steps fail or if the alarm returns, replace the ONS 15216 EDFA3 with a spare and return the unit for service.

14.11.8 COMFAIL

This alarm condition indicates an intermittent loss of communications on the internal I2C communications buss that links the internal subassemblies in the ONS 15216 EDFA3. If this alarm persists, the ONS 15216 EDFA3 will issue the EQUP alarm described above.

The circuitry associated with internal I2C communications is not user serviceable. If this alarm persists, the ONS 15216 EDFA3 unit which exhibits the alarm must be replaced with a spare and returned for service.

14.11.9 CTMP, FTMP, L1TMP, L2TMP, L2BIASD, L2BIASF, L1BIASD, L1BIASF

These alarm conditions indicate that the main EDFA optical amplifier subassembly is operating under conditions of excessive temperature or excessive laser bias current. As the pump laser temperature rises, the laser current will also rise due to the physical properties of the laser, so these alarms can be caused by environmental factors (ambient temperature out of range) or by the natural degradation of laser performance near the end of the lasers useful operating lifetime.

- CTMP Case Temperature Out Of Range
- FTMP Fiber Temperature Out Of Range
- L1TMP Excessive Pump 1 Temperature
- L1BIASDLaser 1 Bias Degrade
- L1BIASFLaser 1 Bias Fail L2TMP
- L2TMPExcessive Pump 2 Temperature
- L2BIASDLaser 2 Bias Degrade
- L2BIASFLaser 2 Bias Fail

Step 1 Verify that the ambient temperature in the area where the ONS 15216 EDFA3 is mounted is not near the upper or lower limits of the specified temperature range of 32 to 122 degrees F   (0 to 50 degrees C). Be sure to take into account local 'hot spots' created by mounting the equipment in a rack or cabinet in proximity with other equipment.

Step 2 Verify that excessive dust or other contamination has not built up on the front or rear heat sink assemblies.

Step 3 Verify that the ONS 15216 EDFA3 has been properly mounted in accordance with the ventilation and rack spacing requirements listed in the installation section of this manual and that cables or other objects are not obstructing ventilation to the front and rear heatsinks of the unit.

Step 4 If the above issues which can effect thermal performance check out ok, and the unit still shows any of the above alarm conditions indicating temperature or operating current above limits, then the pump lasers have degraded and the unit will need to be scheduled for replacement.

14.11.10 LINE1RXPWRFL

This alarm condition indicates that the optical power measured at the main input to the ONS 15216 EDFA3 has fallen below the lower failure threshold. This is a Critical Service Affecting alarm.

Warning **Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.**

To clear the **LINE1RXPWRFL** alarm indication, proceed with the following steps:

Step 1 Verify that the optical input level has fallen below the failure threshold by making an independent measurement at the input to the ONS 15216 EDFA3 using a wavelength selective optical power meter or an optical spectrum analyzer.

Step 2 If the optical input power is confirmed to be below the failure threshold, troubleshoot the upstream fiber path feeding the ONS 15216 EDFA3.

Step 3 If the input optical power is normal, clean the input side optical connectors and recheck the **LINE1RXpwr** level using the **RTRV-DWDM** TL1 command.

Step 4 If the power reported by the ONS 15216 EDFA3 using the **RTRV-DWDM** command still does not agree with the actual optical power measured at the input connector to the ONS 15216 EDFA3, then the ONS15216 EDFA3 has an internal fault and must be replaced.

14.11.11 GAINDH, GAINDL

In CONSTANT GAIN mode, these alarm conditions indicate that the closed loop feedback system that adjusts the EDFA gain is having problems meeting the required gain set point.

Warning **Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.**

To clear any of the above alarm indications proceed with the following steps:

Step 1 Verify that the input side optical signal is nominal using an optical spectrum analyzer or wavelength selective optical power meter (if the input optical signal is not normal correct the upstream fault).

Step 2 If the input optical signal levels are correct, clean the input side and DC port optical connectors

Step 3 If this alarm persists (with a normal optical input signal) after the optical port connectors have been cleaned, then the ONS15216 EDFA3 will have to be swapped for a spare and returned for service.

14.11.12 LINE1TXPWRFL, LINE1TXPWRDH, LINE1TXPWRDL

These alarm conditions indicate out of range optical power at the main optical output port.

- **LINE1TXPWRFL** Power Fail Low LINE1TX Port
- **LINE1TXPWRDH** Power Degrade High LINE1TX Port
- **LINE1TXPWRDL** Power Degrade Low LINE1TX Port

Warning **Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.**

To clear any of the above alarm indications proceed with the following steps:

Step 1 Verify that the input side optical signal is nominal using an optical spectrum analyzer or wavelength selective optical power meter (if the input optical signal is not normal correct the upstream fault).

Step 2 If the input optical signal levels are correct, clean the input side and DC port optical connectors

Step 3 If this alarm persists (with a normal optical input signal) after the optical port connectors have been cleaned, then the ONS15216 EDFA3 will have to be swapped for a spare and returned for service.

14.11.13 LINE2RXPWRFL

The ONS 15216 EDFA3 has an optical input and output port midway between the amplifier stages. This allows a Dispersion Compensation (DC) unit to be inserted into the gain path midway between the two amplifier stages where it can provide optimal performance. This alarm condition indicates that the optical power returning to the EDFA3 from the intermediate Dispersion Compensation port is below the failure threshold. This alarm can be caused by a fault in the external DC unit or bypass attenuator cable.

⚠️ **Warning** **Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.**

To clear the **LINE2RXPWRFL** alarm indication proceed with the following steps:

Step 1 Verify that the input side optical signal is nominal using an optical spectrum analyzer or wavelength selective optical power meter (if the input optical signal is not normal correct the upstream fault).

Step 2 If the input optical signal levels are correct, clean the input side and DC port optical connectors

Step 3 Measure input and output optical levels for the optical components in the DC loop between DCTX and DCRX and verify that the insertion loss of the DC unit or bypass attenuator is correct.

Step 4 If this alarm persists (with a normal optical input signal) after the optical port connectors have been cleaned, then the ONS15216 EDFA3 will have to be swapped for a spare and returned for service.

14.11.14 VOADH, VOADL, VOAFH

These alarm conditions indicate that the internal electrically adjustable Variable Optical Attenuator (VOA) is not able to achieve the required attenuation set point. The VOA is used along with adjustable pump laser power to optimize gain, tilt, and noise in the EDFA3. The system measures the input and output side optical signal levels of the VOA to confirm proper operation.

⚠️ **Warning** **Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.**

To clear **VOADH**, **VOADL**, or **VOAFH** alarm indications proceed with the following steps:

Step 1 Verify that the input side optical signal is nominal using an optical spectrum analyzer or wavelength selective optical power meter (if the input optical signal is not normal correct the upstream fault).

Step 2 If the input optical signal levels are correct, clean the input side and DC port optical connectors

Step 3 Measure input and output optical levels for the optical components in the DC loop between DCTX and DCRX and verify that the insertion loss of the DC unit or bypass attenuator is correct.

Step 4   If this alarm persists (with a normal optical input signal) after the optical port connectors have been cleaned, then the ONS15216 EDFA3 will have to be swapped for a spare and returned for service.

14.11.14   VOADH, VOADL, VOAFH