Guidelines for Full Traces Analysis

Background

1. OTDR full trace analysis is carried out when
    a. Compliance of the installation is required to be established along with the compliance and/or of embedded components.

2. OTDR full trace analysis provides a graphical representation of the installed cabling and identifies individual embedded events within the links or channels.

3. The conformance requirements of OTDR full trace analysis is those specified by Published National Standards for Links, Channels and embedded components i.e. cables, mated connectors and splices, for optical attenuation and connector return loss.

4. Optical Fibre traces taken at time of installation are often used for comparison over the life of the cabling system.

5. OTDR full trace analysis is used to identify anomalies within Optical Links or channels.
    a. These anomalies could include:
        i. Length variation between LSPM and OTDR testing.
        ii. Additional connectors and or splices contained within the link or channel.
        iii. Damage, repairs, or stress on the cable.
        iv. Splices or mated connector events indicate high losses
        v. Contaminates on fibre ends.
        vi. Continuity and polarity mismatch.

6. Some anomalies are a result of testing methodologies and do not reflect the true status of the installed cabling, however; it is impossible to confirm the status of an installed cable when these anomalies caused by the testing regime exist. Anomalies may be caused by issues related to Pulse Width, Range, Averaging (sampling).

Criteria for Compliance

Assessment criteria for compliance for an OTDR full trace analysis include the following:

1. Correct Launch and Tail cables have been used.

2. Testing has been carried out in two directions and at two applicable wavelengths.

3. Mated connector reflectance does not exceed -35dB for Single-mode installations and -20dB for Multi-mode installation.

4. Mated connector loss (average) does not exceed the following:
    a. Mated connector linking Launch/Tail cord to link under test;
        i. 0.3dB for Multi-mode.
        ii. 0.5 dB for Single-mode.
    b. Embedded mated connectors 0.75db.
    c. The use of reference grade test connectors is specified for Launch and Tail cords.
    d. Accurate optical attenuation from OTDR traces requires the averaging of bidirectional test results.

5. Embedded splice loss (average) does not exceed 0.3dB.

6. Optical attenuation (average) of a cable does not exceed the following:
    a. 0.35 dB/Km for Multi-mode
    b. 0.1 dB/Km for OS1 Single-mode
    c. 0.4 dB/Km for OS2 Single-mode

7. The OTDR trace should not indicate any embedded event over 0.1 dB that is not associated with documented splices or mated connectors in either direction.
    a. The indication of embedded events may be a result of:
        i. Stress or damage to the installed cabling.
        ii. Incorrect or inappropriate test configuration and or OTDR setup.

8. OTDR Traces provide adequate test data to carry out analysis.
    a. The quality of an OTDR trace is affected by performance characteristics of the OTDR and the setup of the OTDR at time of test.
    b. Range used for OTDR testing should not exceed more than fifty percent of the length of the launch, tail and cable under test.
    c. The pulse width for testing should not exceed 30ns;
        i. 10ns per kilometre is often used as a good guide for pulse width when testing.
        ii. The maximum expected fibre run within customer premises is not expected to exceed 2 Kilometres.
    d. Averaging time should be suitably long to avoid false reporting of events along the cable.