

A network diagram with white nodes and connecting lines on a dark blue background, spanning the top of the page.A white circle containing a black upward-pointing arrow, located on the right side of the page.

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Fixing the right problem



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Customer Challenge

Our customer was experiencing a higher than normal error rate with a XFP transceiver-based 10G dense wave division multiplexing DWDM span with passive DWDM components, on physical plant fiber with less than ideal characteristics. Combined loss over the fiber and through the passive filters was measured to be outside the bounds of the optics' power budget.

Further complicating any correction to restore, the condition went undetected until test and turn-up time, thus making it virtually impossible for network operators to optimize in time. A solution would require a rapid deployment.

Integra Optics Solution

Install a pair of Integra pre-amp erbium doped fiber amplifiers (EDFAs) at both ends of the circuit to boost DWDM optical power and reclaim additional power budget margin where the input signal to noise sufficiently meets DWDM XFP transceiver minimum receive (Rx) sensitivity.

Project Summary

Extended range (80km) XFPs were already in use, so upgrading the optical power budget was not an option. The degraded circuit scenario occurred when activating four different DWDM 10G circuits over a span with 40-Channel DWDM Mux/Demux Passive Filters, and 10G optics on either end of the circuit with a 23db link budget. The DWDM XFPs in this project operate at or near -23dBm receiver threshold ([Figure 1](#)). The losses in the customers end to end circuit span attenuate the signal beyond the XFPs receiver's ability to detect valid input and as a result the condition appears as CRC errors. In principle, the goal of installing Integra Pre-Amp EDFA's is to gain back sufficient loss to eliminate. In practice, EDFA's accomplished that goal and amplified the circuits by approximately 6db to boot ([Figure 2](#)).

Result

Because of Integra's extensive in-stock components and passive equipment, the customer received components immediately. Adding to the speed of the solution was Integra's engineering team, who solved the problem by utilizing stock products in innovative ways. This solution proved to be a very efficient way to upgrade.

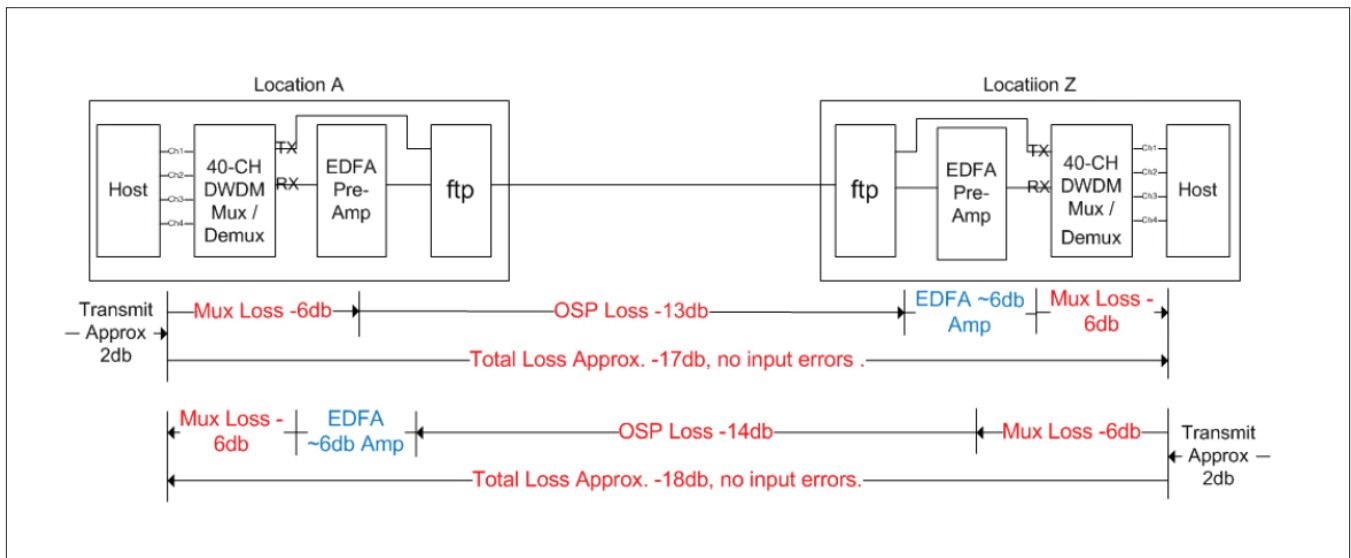


Figure 1. Optical results without EDFAs

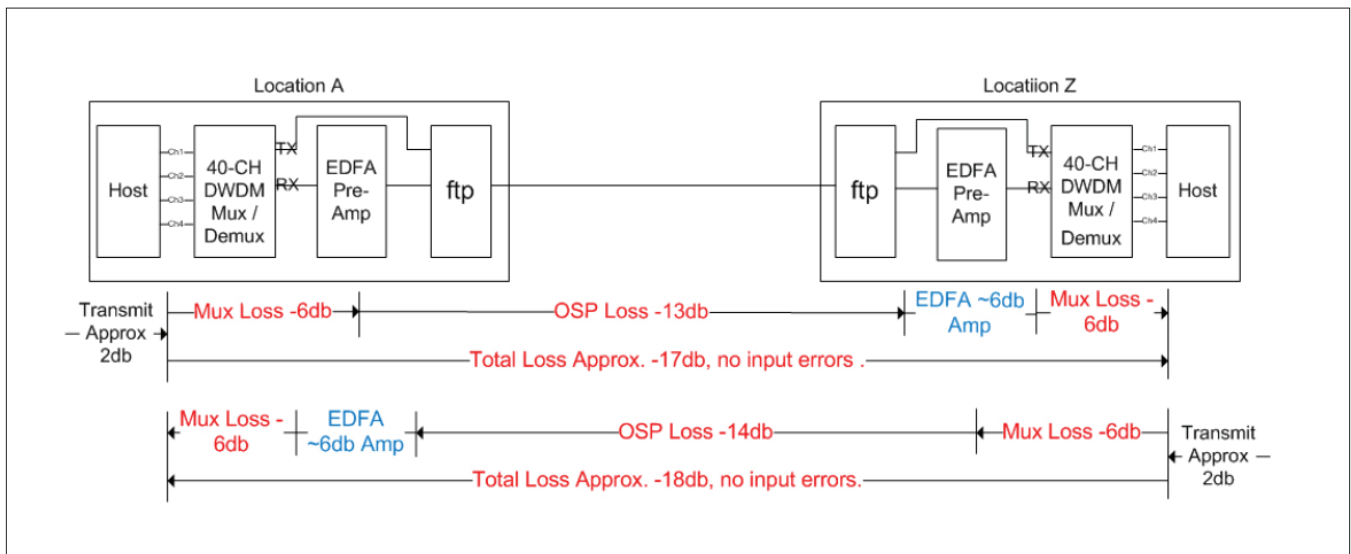


Figure 2. Optical results with EDFAs

Integra Optics Equipment Used

- ➡ Integra 80km DWDM XFP transceivers
- ➡ Integra Pre-Amp EDFAs