

# Polarization Mode Dispersion (PMD) Field Measurements - An Audit of Brazilian Newly Installed Fiber Networks

S. Barcelos, T. S. Azevedo, R. F. Rando, E. L. Rigon, N. K. Sasaki, W. Arellano, A. Alkschbirs, W. Benetti, D. Lima  
*FiberWork Optical Communications, R. Alfredo da Costa Figo 280, Campinas SP, 13.087-534, Brazil*  
sbarcelos@fiberwork.com.br

We have conducted PMD diagnostics in several thousands of Brazilian newly installed fibers. We have compiled part of these data into a PMD measurement audit similar to those ones compiled by Telcordia [1] and Telia [2] for the U.S. and Swedish fiber plants, respectively. Our survey was made by sampling over 2000 fibers installed between 1998 and 2002 and is a sample of the PMD status of the Brazilian new fiber plants.

The audit reveals that 19% of such fibers present high levels of PMD (see Fig. 1) and, therefore, do not comply with requirements for new and future transmission technologies, such as 10 Gb/s and 40 Gb/s. Also, as PMD induces higher bit error rates, OSNR margins become lower and, therefore, less DWDM channels can be lit in such higher PMD fibers.

To overcome the PMD problem, PMD compensators may be used in a network but at the cost of introducing complexity, higher investments and bringing financial losses for those carriers which own or acquire such fiber plants. Fiber networks are expected to have a profitable life time of 20-25 years. However, if a newly installed fiber bears a PMD level higher than that required by currently available transmission technologies, then this investment has been born dead.

Several other results from this audit, including PMD levels *versus* cable plant types (aerial, OPGW, buried ducts), PMD levels *versus* cable manufacturers, PMD frequency *versus* installation dates will be presented soon in a major technical conference.

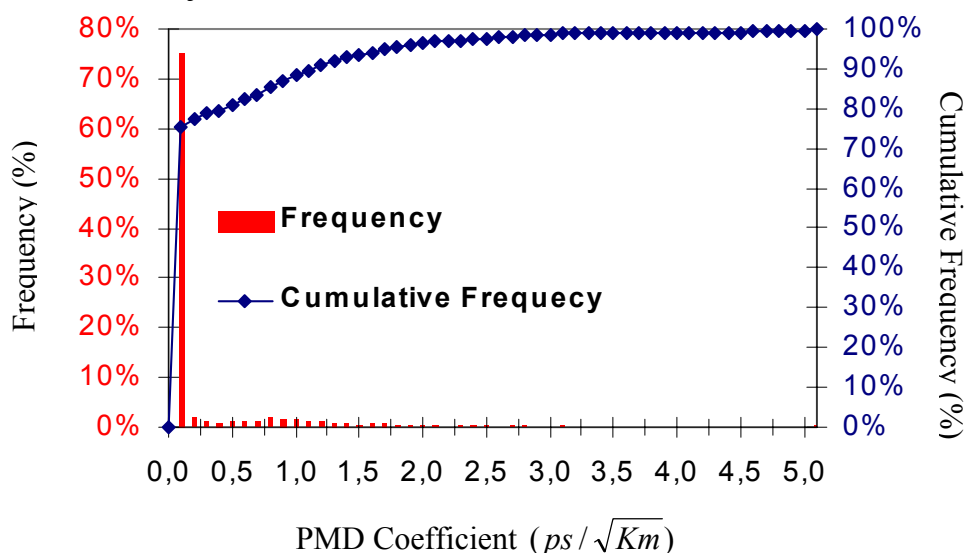


Fig. 1: PMD results of Brazilian newly installed fibers collected by FiberWork - *compilation summary*

## References:

- [1] Peters J., Dori A. and Kapron F., "Bellcore's Fiber Measurement Audit of Existing Cable Plant for Use With High Bandwidth Systems", Proc. of the NFOEC'97, San Diego, CA, Sept. 1997.
- [2] Brising K., "Polarization Mode Dispersion Field Measurements - A Survey of The Swedish National Network", Proc. of the 1996 International Wire & Cable Symposium, pp. 18-26.