Max DGD Penalty

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Background

- In recent 802.3 task force contributions, anslow_3cu_01_0519 and castro_3cu_adhoc_070319, new lower Max DGD values have been proposed and accepted

- These recommendations for lower values are based on deployment of primarily G.652.B and D fiber over the last 10-15 years.

- These fiber types have a lower PMD_Q specification value of 0.2 ps/√km as compared to earlier G.652.A and C fiber types with value of 0.5 ps/√km

- These new values have been written into the 802.3cu draft

Data from anslow_3cu_01_0519

DGD_max 3

Vince Ferretti from Corning has helpfully pointed out a relevant publication:

JACOBS, S.A. et al., Statistical Estimation of PMD Coefficients for System Design. Electronics Letters, 1997, 33, pp. 619-621

This includes an analysis of 288 randomly selected scaled cabled fibers.

Equation 10 of this is:

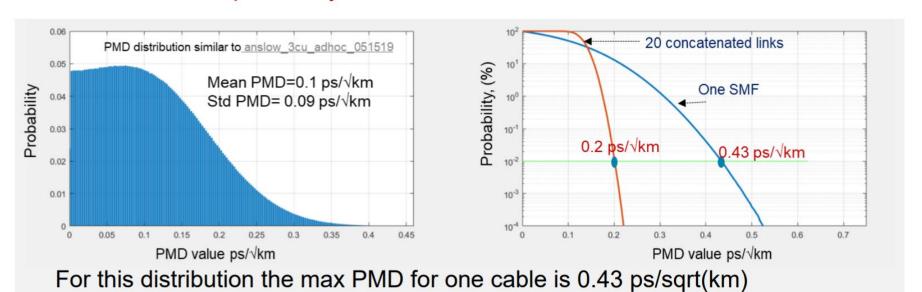$$X_Q = \frac{\left(2.004 + 0.975\sqrt{n} \times 0.979\right)}{\sqrt{n} \times 48.6}$$

For $n = 1$ (one cable segment), this evaluates to $X_Q = 0.426$ ps/√km

For a 10 km link and with a ratio of "Max" DGD to mean DGD of 3.75, this is also a DGD_max of 5 ps.

Data from castro_3cu_adhoc_070319

Proposed Max DGD values for 802.3cs

- For 50km: 0.43 ps/√km x 3.75 x √50km = 11.4ps

Conclusions

- 802.3cu has provided updated max DGD values to be considered for 802.3 projects

- These updates are based on considering that most if not all of the fiber that has been deployed over the last 10-15 years has been G.652.B or D fiber, both of which have a lower PMD_Q specification

- Recommend that 802.3cs adopt this same methodology

Thanks!