Comment 84: 802.3aq LRM Draft 3.0

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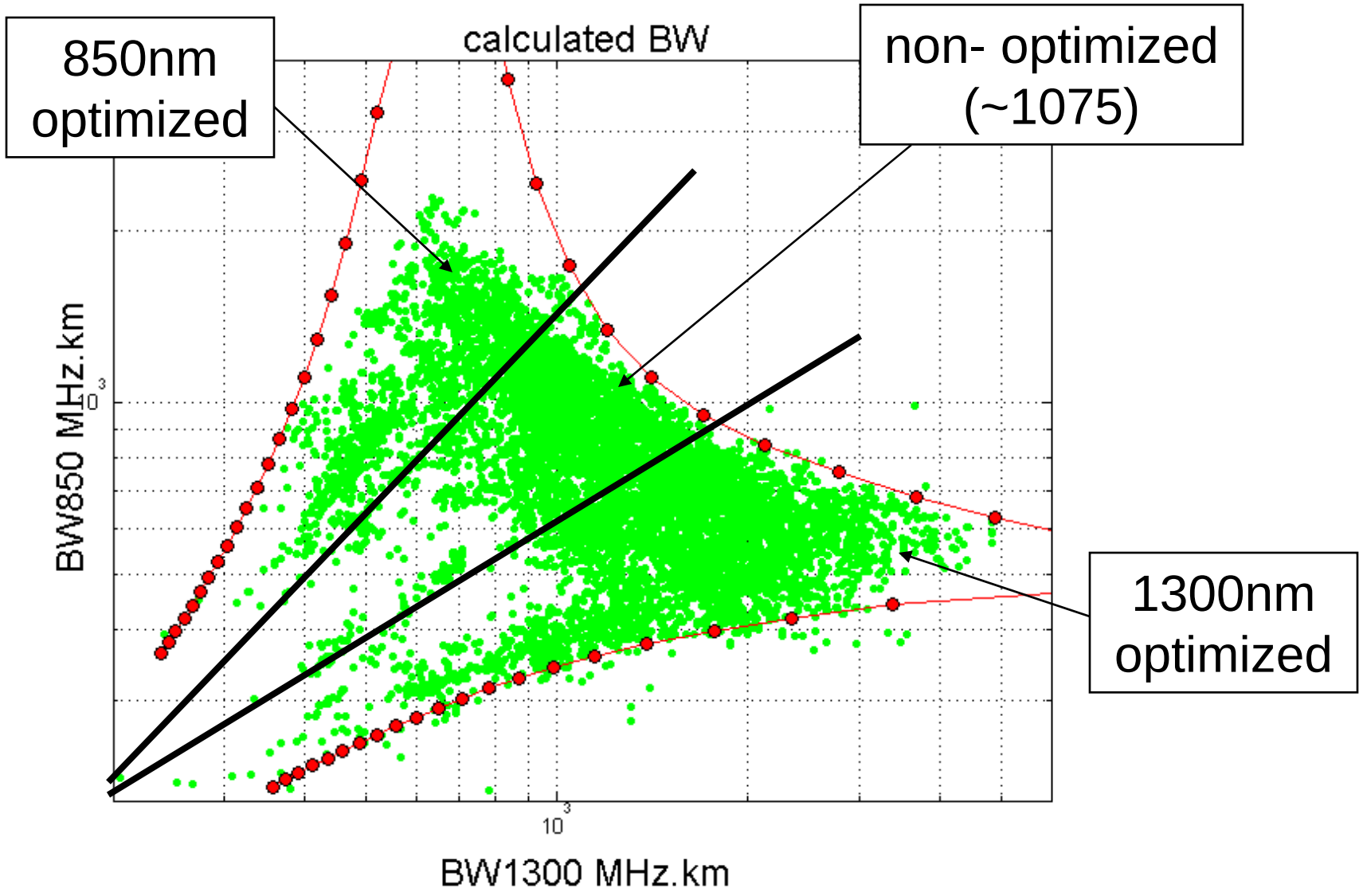
802.3aq LRM interim meeting

Phoenix January 12, 2006

Summary Graphic – Comment 84



Comment -- Remedy

COMMENT: The index perturbations for OM1 and OM2 fibers are significantly different. OM1 fibers are optimized for 1300nm, while OM2 fiber can be either 850- or 1300- optimized. The result is that the supported length, the stressors, and the failure probability cannot all be the same.

It is likely is that OM2 fiber meeting the minimum OFL criteria and optimized for 850nm will have a significantly higher failure rate. The stressors need to be adjusted to take this into account, or the supported lengths for OM1 and OM2 need to be different.

REMEDY: Supported length and/or stressors for OM2 fiber need to ensure that the link will work regardless of the 'type' of OM2 fiber installed (i.e. 1300-optimized, 850-optimized, or generic dual window). Divide the OM2 'distribution into approximately thirds (1300-, 1075-, and 850- optimized), and determine the stressors necessary for each third to meet the supported length. Use the most conservative

Reminder to LRM task force

A modification to the OM2 data set was recommended at Nov meeting in Vancouver, following up on both 1300nm modeling for 10GBASE-LRM and 850nm modeling for 8Gb Fibre Channel (T11.2).

http://www.ieee802.org/3/aq/public/nov05/abbott_1_1105.pdf

T11.2 files at http://www.t11.org/index.htm

Presentation T11/843v0

Implications of a “mixed distribution”

AFFECTS BOTH 10GBASE LRM and 8Gb Fibre Channel

Because the OM2 distribution is “mixed”, it is less meaningful to talk about a “failure rate” for the distribution as a whole.

The fact that the 850 and 1300nm OFL BW distributions are not the same reflects a mixed distribution of “orders”.

Customers who installed one type of OM2 fiber may see one effect on moving to 850nm 10Gb, while others may see a different effect. Likewise for 1300nm LRM.

Results of mixed distribution

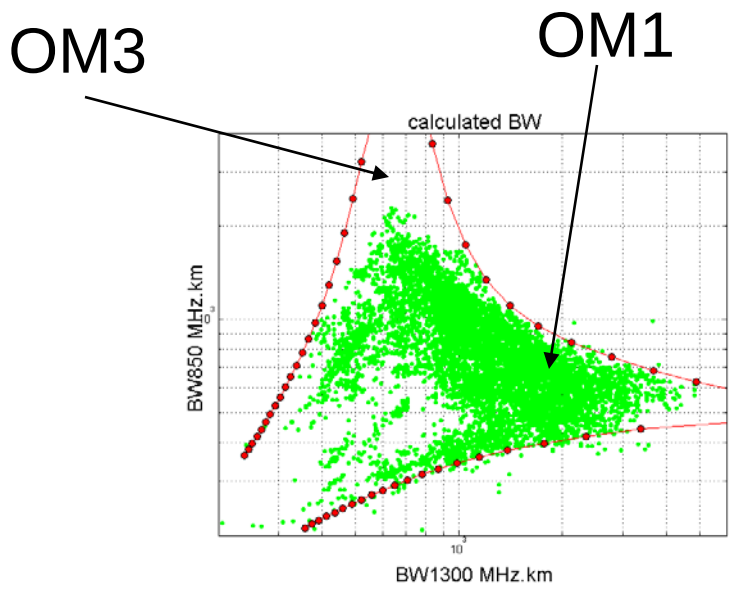
The 1300-optimized fibers tend to perform lower at 850nm, with a higher failure rate. This affects the T11.2 FC work

The 850-optimized fibers tend to perform lower at 1300nm (like OM3 fibers with additional center problems), with a higher failure rate. This affects the 802.3aq LRM work.

Rather than an aggregate failure rate the standards should be designed to handle worst case.

Differences in “statistics” of OM1/OM2/OM3

The OM1 distribution is optimized for 1300nm, the OM3 distribution is optimized for 850nm, and the OM2 “distribution” is less well defined, because customers have ordered 1300nm-optimized, 850nm-optimized, and dual window fiber.



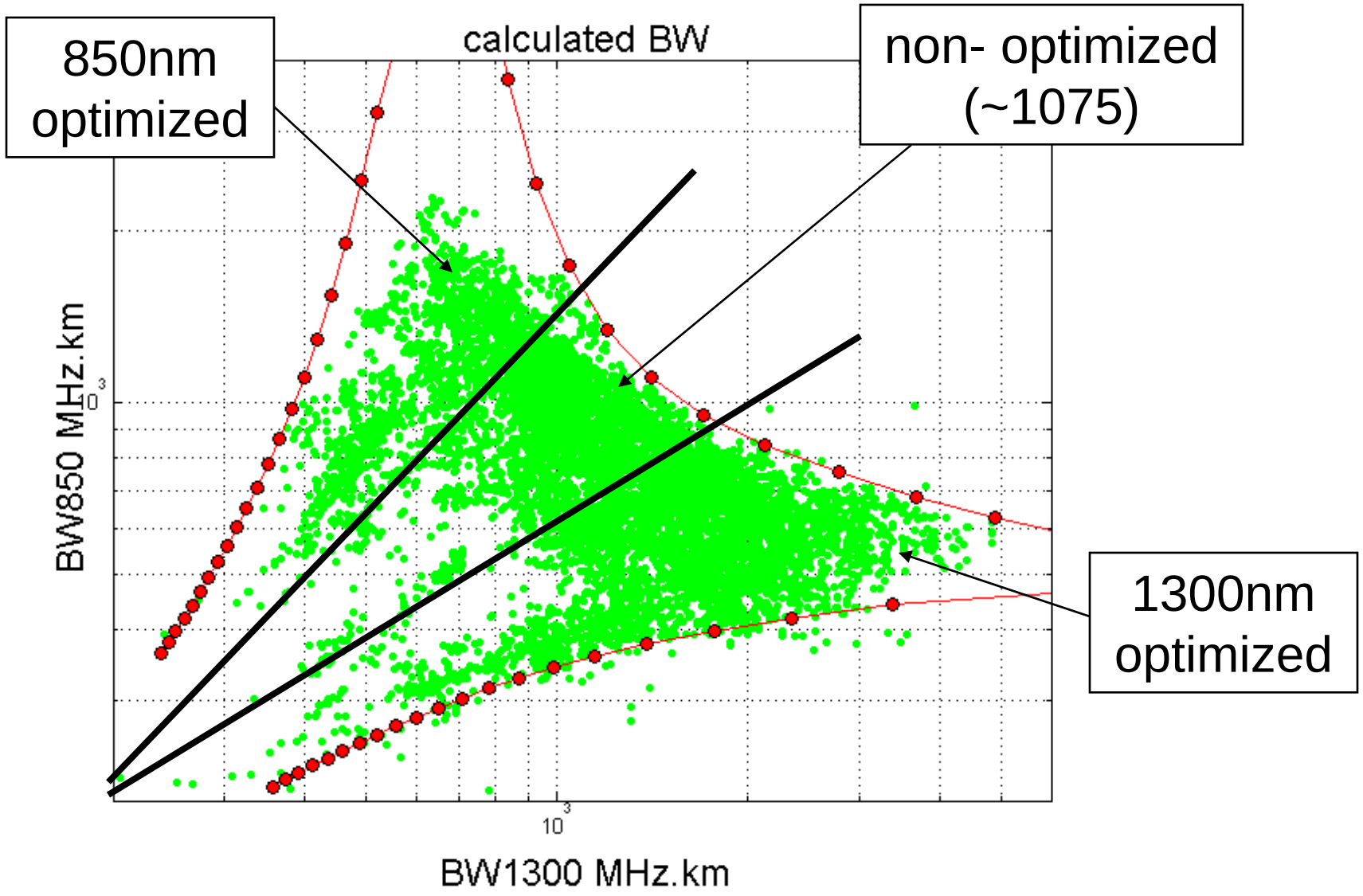
European OM2 orders proportionally more 500/1200=1300nm optimized;

US OM2 orders mixed, proportionally more 500/500. If perfectly balanced, OFL850 & OFL1300 match.

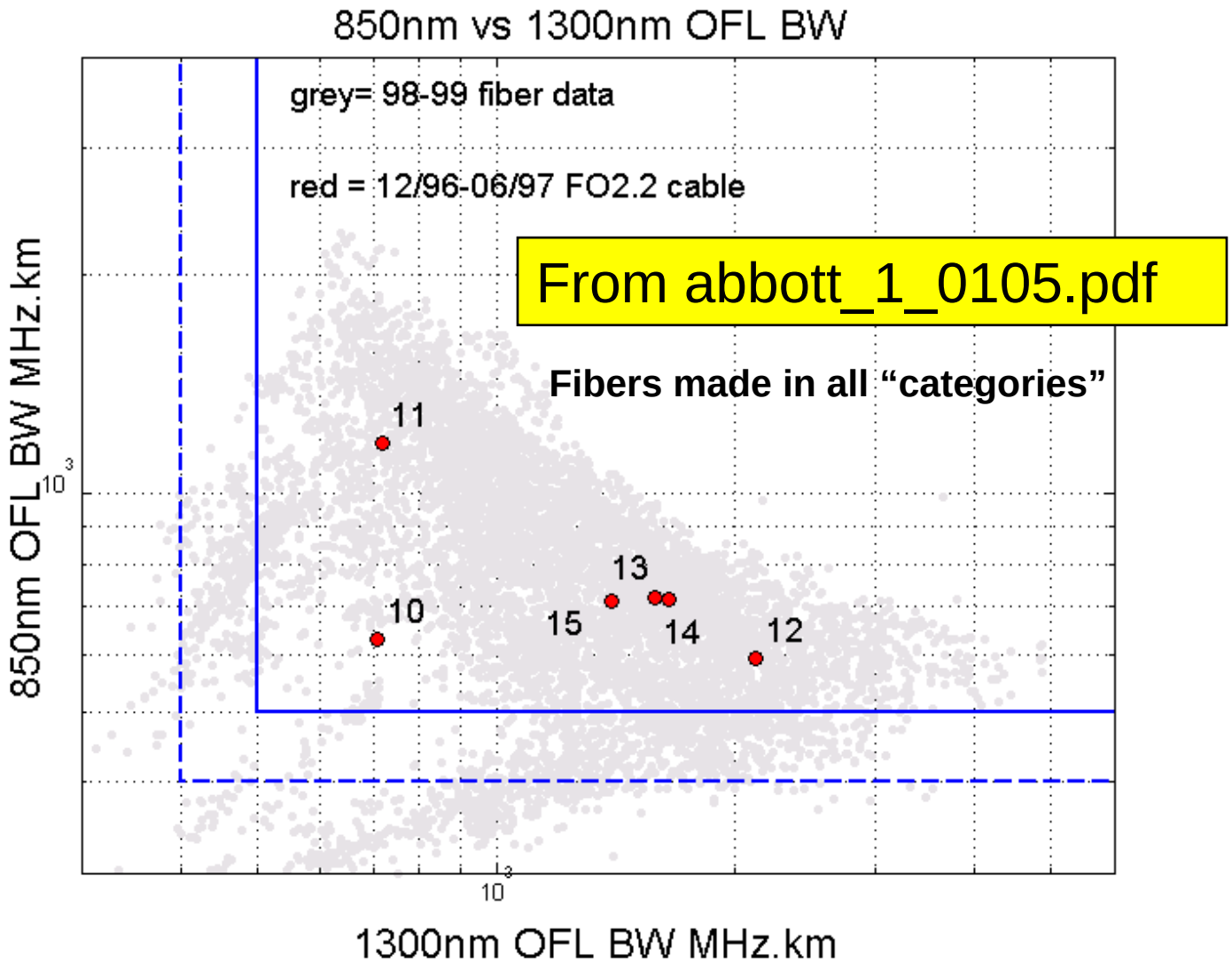
Recommendation

The OM2 analysis should be modified to be closer to worst case. An individual installation will likely have ‘similar’ fibers so that it makes sense to design for sub-populations of the OM2 distribution, and guarantee performance for the subpopulations.

Dividing data set into Sub-populations



OM2: OFL BW850 vs OFL BW1300



OM1:

1=1 Orange
2=1Green
3=1Blue
4=2Orange
5=2Green
6=2Blue
7=3Aqua
8=3Blue
9=3Violet

OM2:

10=4Orange
11=4Green
12=4Blue
13=5Orange
14=5Green
15=5Blue