Additional Information on ISO/IEC Liaison 3N779

Presented by

Henriecus "Riekus" or "Henri" Koeman

Fluke Networks

Topic 1

- Alternative link segment alien crosstalk specifications are proposed by 3N779:

    - **1st format is intended to match closely with IEEE 802.3an D3.1, but with some cabling related reformulation.**

    - **2nd format is intended to match the requirements of IEEE802.3an D3.1, but with more detailed equations.**

- IEEE 802.3 is kindly requested to verify that these (Annexes 3 & 4 of 3N779) are correct.

- It would be best to agree on common text for IEEE 802.3 and ISO/IEC TR-24750.

Topic 2

- Cabling standards need to specify requirements in an application independent manner.
- It is intended to specify cabling requirements to ensure compliance with 10GBASE-T.
- The specific challenge relates to PS AACR-F (was "PS ELFEXT").
- Comments are requested on the method for "normalization" contained in Annex 2 of 3N779.

Topic #1:
Formulation of requirements in ISO/IEC TR-24750

Formulation of 10GBASE-T requirements in TR-24750

- PS AACR-F is determined by:

  - **Power Summing pair-to-pair AFEXT.**

  - **Computing PS AACR-F = PS AFEXT-IL (of the <u>disturbed</u> link segment)**

  - **This is different then the PS method in IEEE802.3an D3.1, which assumes equal length of disturber and disturbed link segments (PS of pair-to-pair AACR-F values).**

Given actual PS AFEXT values, the Alien Crosstalk Margin Computation can be simplified and made more specific:

- This simplifies Alien Crosstalk Margin Computation (ACMC), as reference may be made directly to the PS AFEXT result.

- The limit values for PS ANEXT and PS AACR-F can be referenced directly.

- The number of computation steps can be further reduced (the end result is just the worst case margins for each pair and the average of the pairs).

- The method of computing the integral is defined from unequally frequency-spaced data.

Request (1) from SC25 WG3 to IEEE 802.3

- **Verify that its interpretation of IEEE 802.3an is correct as shown in Annexes 3 & 4 of 3N779.**

- **If possible, adopt common text for IEEE 802.3an and ISO/IEC TR-24750. If this is not possible, SC25 WG3 is likely to retain a "straight" translation of IEEE802.3an to avoid incorrect interpretation.**

Topic #2:
Normalization constants applicable to Augmented Cabling

Objectives for
Class E$_A$ & Class F$_A$ Cabling

- **Specify in an application independent manner.**

- **Support 10GBASE-T operation.**

- **PS AACR-F is a problem if there is no "power backoff".**

  - **The "verification" guideline is the Alien Crosstalk Margin Computation (ACMC), as specified in IEEE 802.3an D3.1.**

Computation of PS AACR-F for unequal length channels

Disturbing channel j

$IL_{i,j}$

$AFEXTL_{k,li,j}$

IL_k

Disturbed channel

Coupling length
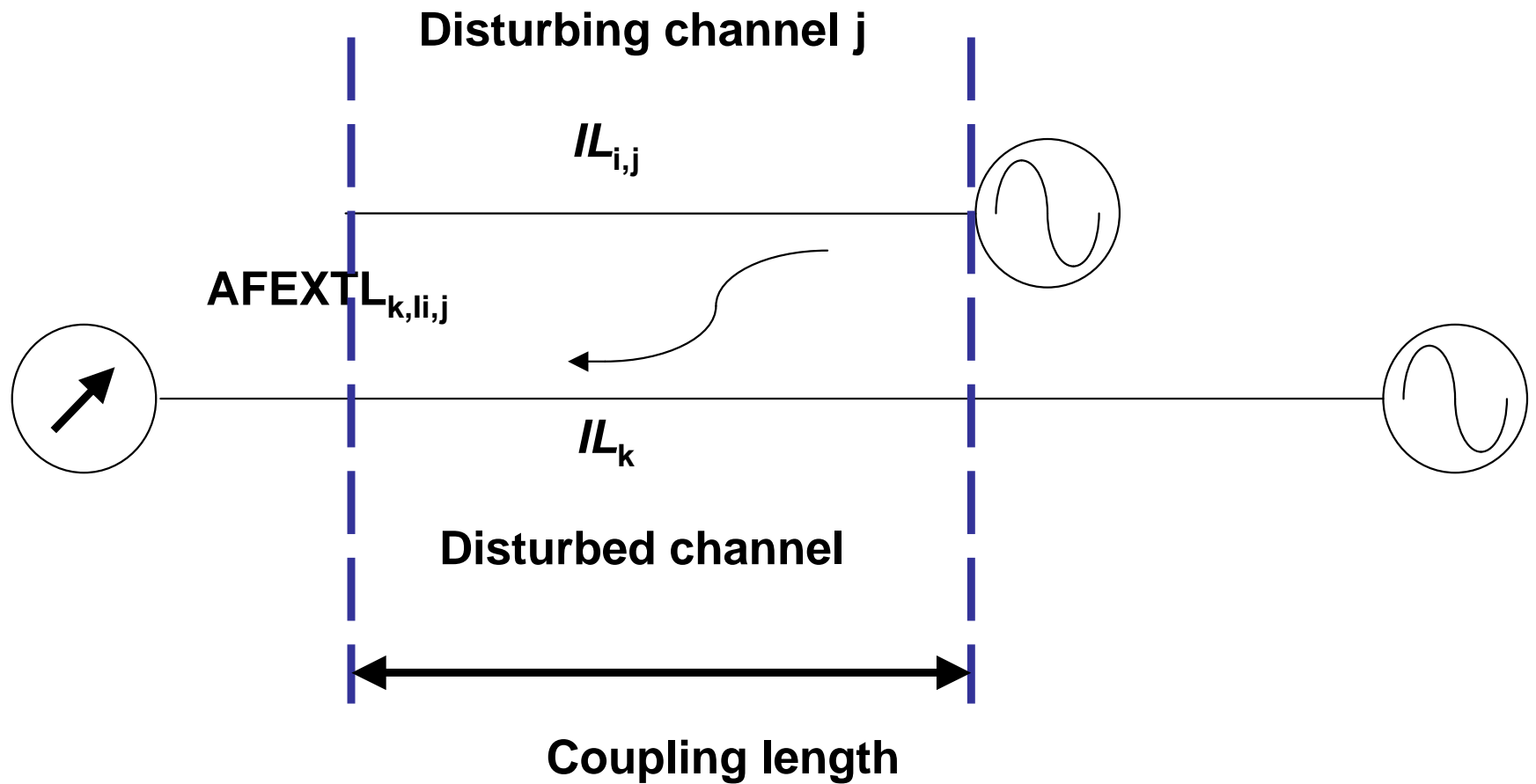
Initial proposal for PS AACR-F computations with unequal lengths

- **Specify a normalization factor, which equals the insertion loss difference of the disturbing and disturber channels.**

- **If the disturbed channel is longer:**

$$AFEXT\text{norm}_{k,i,j} = AFEXT_{k,i,j} + IL_k - IL_{i,j}$$

- **If the disturbed channel is shorter:**

$$AFEXT\text{norm}_{k,i,j} = AFEXT_{k,i,j}$$

Use normalized responses to compute PS AFEXT and PS AACR-F

- **PS AFEXT is computed from "normalized" AFEXT responses:**

$$PS\ AFEXT_{k} = -10\lg\left(\sum_{j=1}^{N} \sum_{i=1}^{n} 10^{\frac{-\left(AFEXTnorm_{k,i,j} \right)}{10}} \right)$$

- **PS AACR-F is computed using the PS AFEXT computed from "normalized" AFEXT responses, using the IL of the disturbed channel:**

$$PS\ AACR\_F_{k} = PS\ AFEXT_{k} - IL_{k}$$

Request (2) from SC25 WG3 to IEEE 802.3

- **Do you expect any issues from this proposed method as shown in Annex 2 of 3N779?**

- **Do you have any proposed improvements or alternative ways to implement application independent alien crosstalk requirements?**

Thank you for your attention.