



*Conceptual relationships among  
TP2 & TP3 tests, and budget*

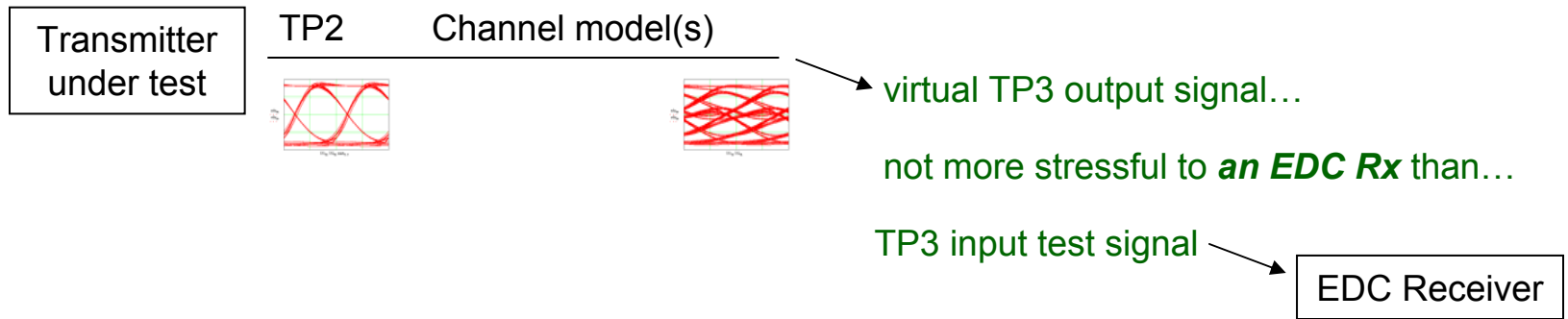
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San Antonio, 11/04

Updated from October presentation to TP2-3 calls

- per lindsay\_02\_0904



- Stresses and limits must relate to and be controlled by the budget
  - Purpose of tests same as budget: interoperability



## *Part A*

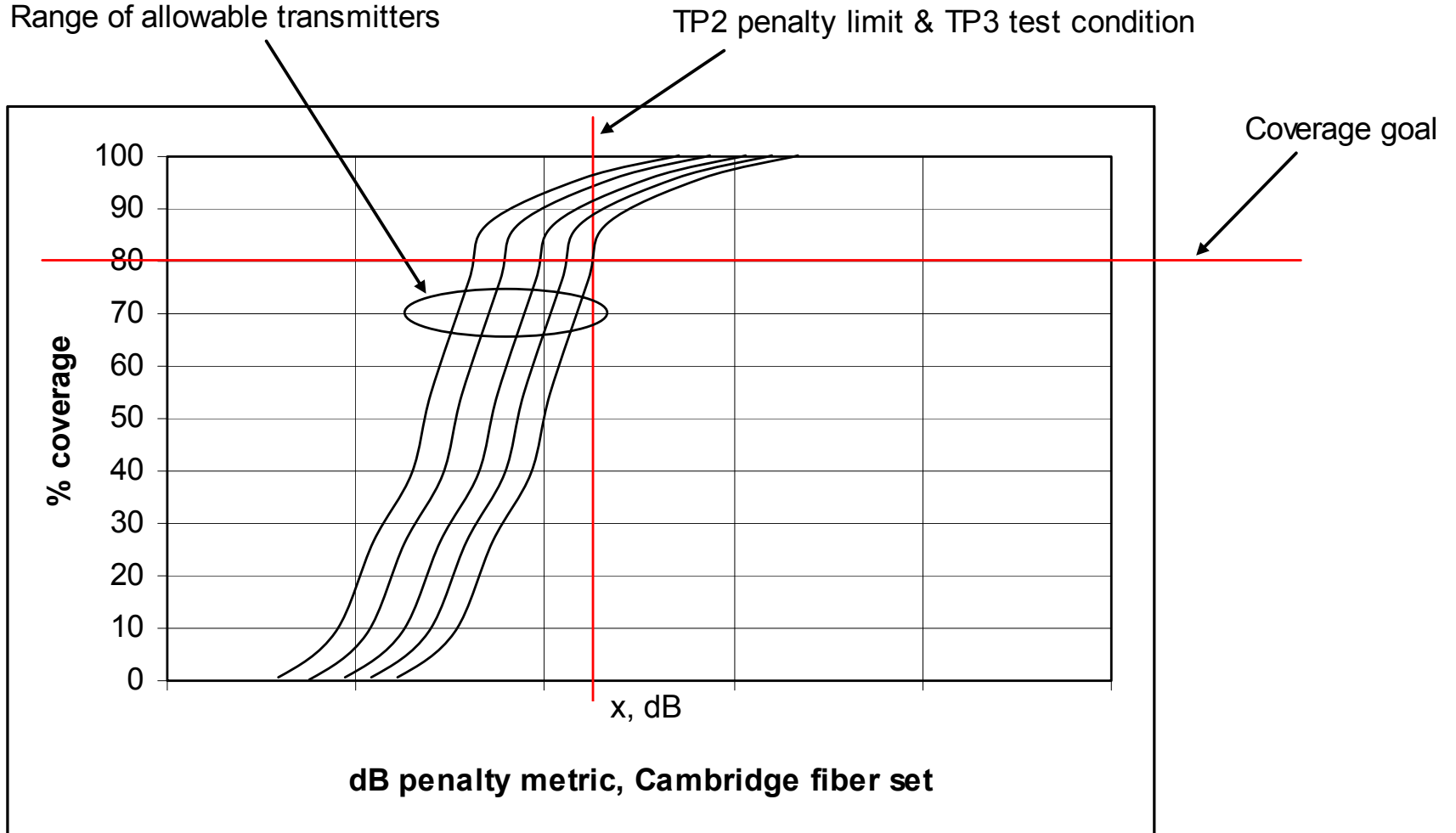
# *Correlated penalties and stresses*

## *part A relationships*

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- TP3 test will include *ref Tx* & emulate channel ISI
  - TP3 test needs to represent combination of  $\sim$ w/c channels and Tx
  - Will have characteristic penalty metric
- Proposed TP2 test will include the *DUT Tx* & emulate channel ISI
  - TP2 penalty test limit *not greater than* TP3 metrics
- The penalty value can & should relate directly to budget

# Graphical view



## *part A proposal details*

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- Set TP2 SW test channels same as TP3 ISI generator HW descriptions
- Describe TP3 ref Tx as ~Gaussian with specific speed
  - Easy to define and achieve
  - Linear and correctable
- TP3 test condition same as TP2 limit
  - Propose 5 dB (TBD), PIE-D or equivalent
    - Key budget value
    - ~70 psec Gaussian pulse at TP2, 20-80%
    - Should offer reasonable flexibility between correctable and uncorrectable impairments at TP2



## *Part B*

*Uncorrelated penalties and stresses*

## *part B relationships*

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- TP3 will add amplitude noise and jitter to emulate RIN and modal noise
  - This setup will have an OMA/noise ratio and jitter
- Proposed TP2 test must impose limits on amplitude noise and jitter
  - Amplitude noise limit must relate/translate to and *be within* RIN portion of TP3 OMA/noise
  - Similar concept for jitter
- OMA/noise values must relate to budget
- Jitter may not relate directly to budget, but TP2 and TP3 values should relate closely to each other



## *part B proposal details*

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- Limit TP2 rms noise to
  - 37.3 (15.7 dBo)
    - Directly based on 0.4 dB RIN value used in budget and TP3 test
  - Allow compensation of ref Rx noise
- Limit TP2 jitter to
  - 0.033 UI rms
    - Relates to 0.1 UI pk-pk in TP3 test (per TAL comment)
    - May need to allow for noise to jitter translation
  - Allow compensation of ref Rx jitter



*Budget*

# Budget, stresses and limits

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Item	dB	dBm	Comment
Tx_min		-4.5	Min Tx OMA at TP2
Connector loss	1.5		
Fiber loss	0.5	-6.5	Min received OMA at TP3; TP3 stress test OMA
TP2 uncorrelated penalty	0.4		Max penalty from the uncorrelated TP2 test
Modal noise penalty	0.5		For TP3 test, combine with max uncorrelated TP2 penalty; emulate combination with white noise
Consequent_pen	0.2		Natural interaction of other penalties
TP2 & dispersion penalty, DFE	5		Max penalty from the correlated TP2 test; combined effect of Tx source and ISI generator in TP3 test
Rx implementation penalty	1.5	-14.1	EDC Rx OMA sensitivity; penalty allocation is TBD
Matched filter vs. -LR Rx	-0.9	-13.2	LR-equivalent Rx OMA sensitivity

## *PIE-D for budgeting*

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- Propose using PIE-D, or equivalent, for budgeting
  - per Aronson proposal drafted in Ottawa
  - Appears DFE is required, especially if 300m is desired
  - Add Rx implementation penalty
  - PIE-L possibly still an useful metric
- Another approach is to define practical DFE Rx
  - Not required for design, but do at least as well as...
  - Eliminate or reduce Rx implementation penalty