Early proposals for AXT for 100MBPS SPE

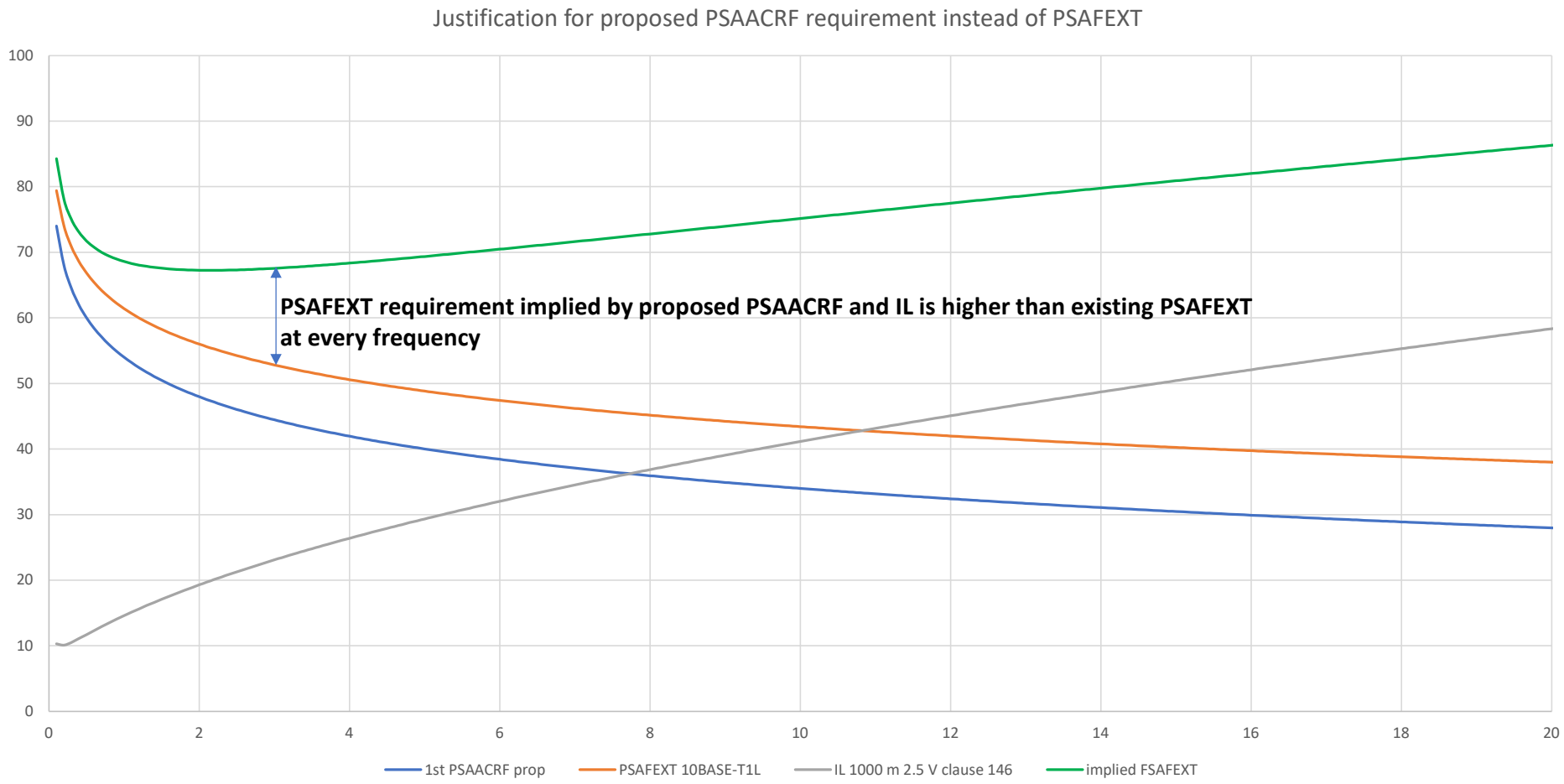
Wayne Larsen CommScope

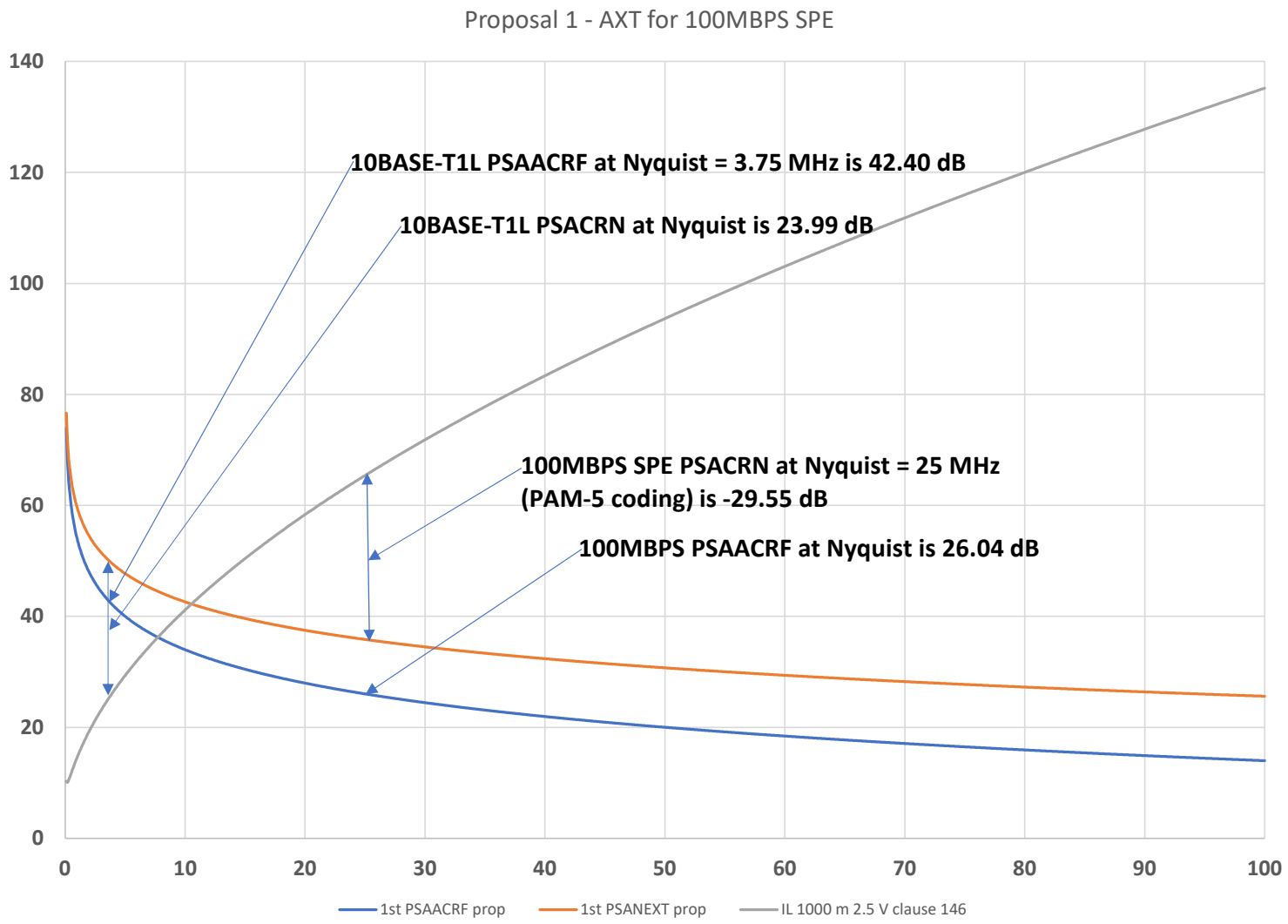
Contributors

-
- Steffen Graber, Pepperl-Fuchs

PSANEXT and PSAACRF proposals for long-reach 100MBPS SPE

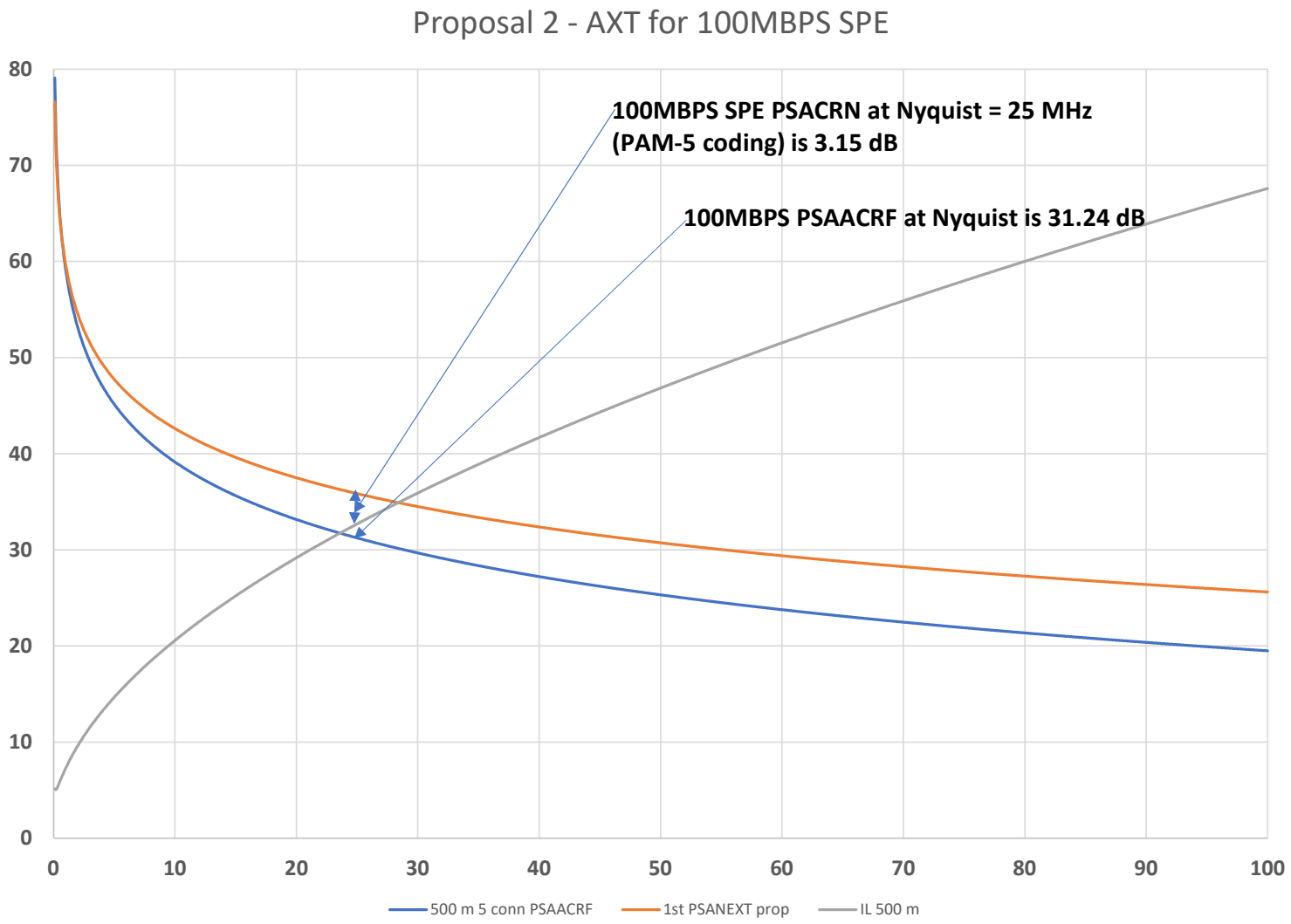
- Proposal 1: Use the limits from 10BASE-T1L extended to 100 MHz
  - PSANEXT = 37.5-17log(f/100)
  - PSAACRF = 54-20log(f) (Same as PSAFEXT = 38-18log[f/20])
- This way we can use the embedded base from 10BASE-T1L


Justification for proposed PSAACRF requirement instead of PSAFEXT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
18
20
PSAFEXT requirement implied by proposed PSAACRF and IL is higher than existing PSAFEXT at every frequency
1st PSAACRF prop
PSAFEXT 10BASE-T1L
IL 1000 m 2.5 V clause 146
implied FSAFEXT


Proposal 1 - AXT for 100MBPS SPE
140
120
100
80
60
40
20
0
0
10
20
30
40
50
60
70
80
90
100
10BASE-T1L PSAACRF at Nyquist = 3.75 MHz is 42.40 dB
10BASE-T1L PSACRN at Nyquist is 23.99 dB
100MBPS SPE PSACRN at Nyquist = 25 MHz
(PAM-5 coding) is -29.55 dB
100MBPS PSAACRF at Nyquist is 26.04 dB
1st PSAACRF prop
1st PSANEXT prop
IL 1000 m 2.5 V clause 146

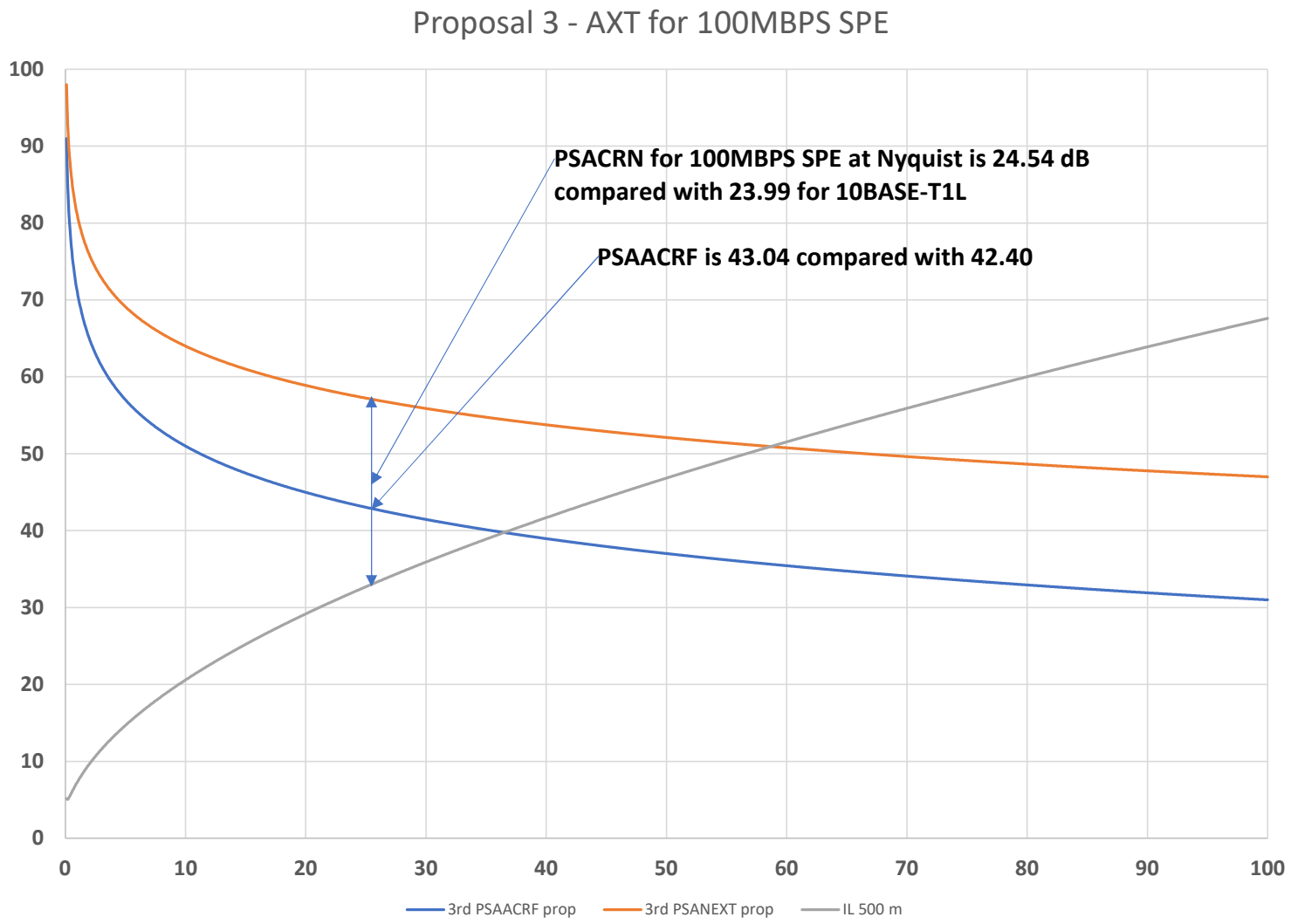
PSANEXT and PSAACRF proposals for long-reach 100MBPS SPE

- Proposal 2: limit the length to 500 m, and the number of connectors to 5 (reduced from 10) to reduce the IL and improve SNR
  - Still can use part of the embedded base from 10BASE-T1L


Proposal 2 - AXT for 100MBPS SPE
100MBPS SPE PSACRN at Nyquist = 25 MHz
(PAM-5 coding) is 3.15 dB
100MBPS PSAACRF at Nyquist is 31.24 dB
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
500 m 5 conn PSAACRF
1st PSANEXT prop
IL 500 m

PSANEXT and PSAACRF proposals for long-reach 100MBPS SPE

- Proposal 3: Improve PSANEXT and PSAACRF so that the SNR at the Nyquist frequency is about the same as for 10BASE-T1L
  - PSANEXT = 81-17log(f) (About 21 dB better)
  - PSAACRF = 71-20log(f) (17 dB better)
  - This requires entirely new cable and connectors
  - But provides better SNR


Proposal 3 - AXT for 100MBPS SPE
PSACRN for 100MBPS SPE at Nyquist is 24.54 dB compared with 23.99 for 10BASE-T1L
PSAACRF is 43.04 compared with 42.40
100
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
3rd PSAACRF prop
3rd PSANEXT prop
IL 500 m

Discussion

Conclusions

- It will be some time before the link segment specifications for 100MBPS SPE need to be finalized
- More proposals are hoped for