

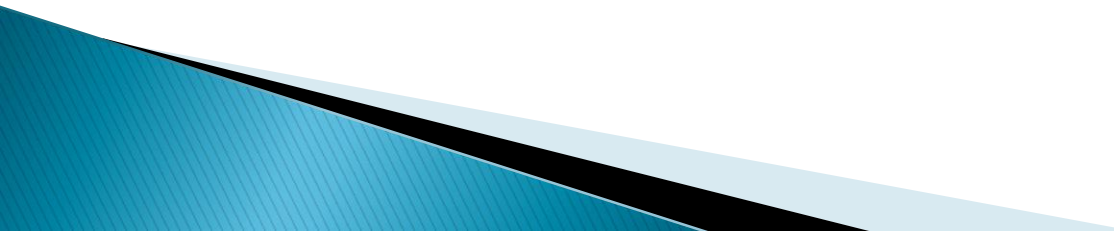
# Tan Delta of New EPR

Kent W. Brown  
TVA Nuclear  
Ft McDowell, AZ

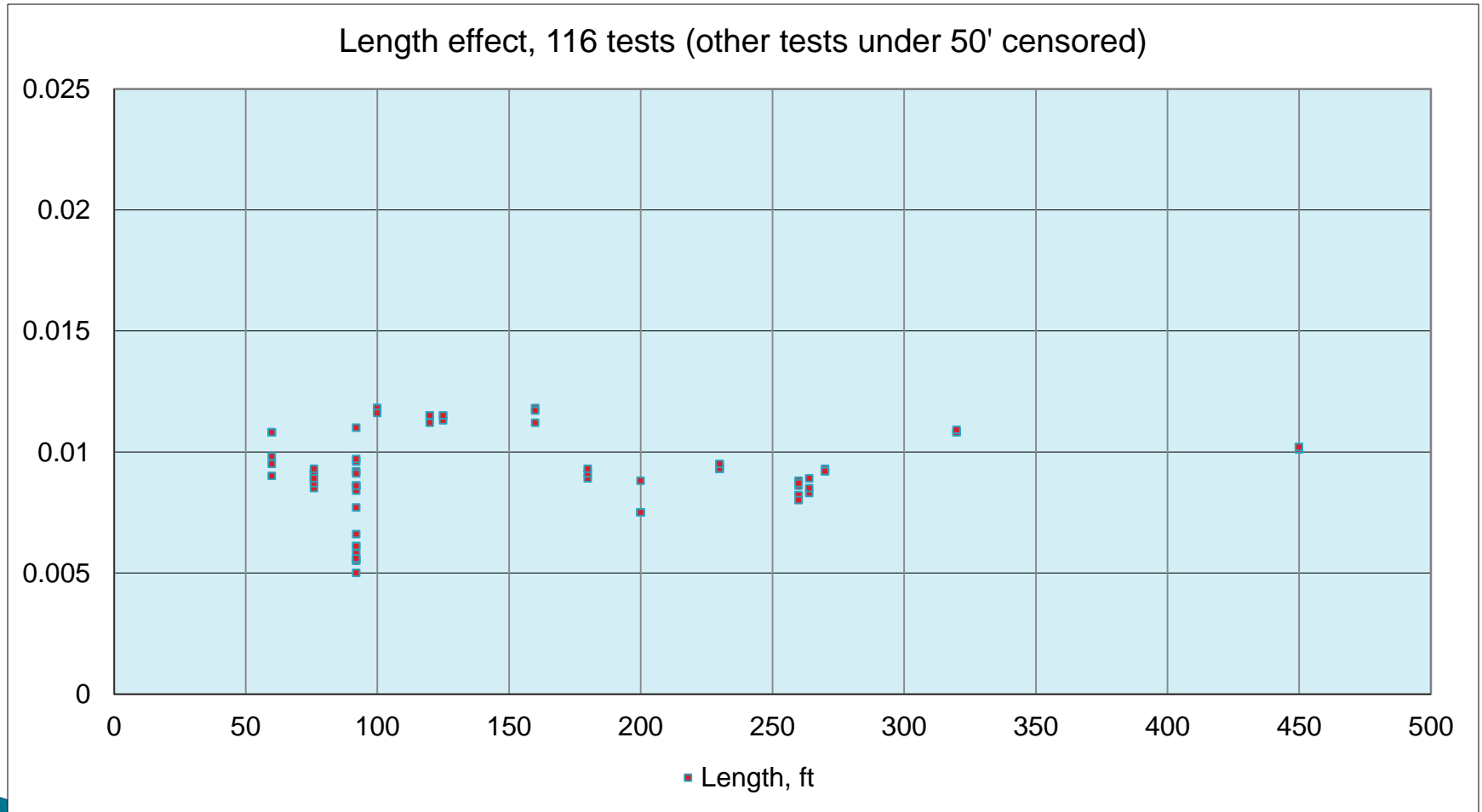
# IEEE P400.2 D9 Table 5

- ▶ Draft proposes mean values as follows
  - No action –  $< 0.040$
  - Further Study Advised –  $0.040$  to  $0.125$
  - Action Required –  $> 0.125$
- ▶ EPR tan delta is very compound specific
- ▶ Single value may not be possible

# Test Specimen Construction

- ▶ All cables were new
  - ▶ Manufactured 1987–2007
  - ▶ From a single manufacturer
  - ▶ 5 and 8 kV rated
  - ▶ 133% wall
  - ▶ Tape shielded
  - ▶ CSPE, TS–CPE or TS–LSZH jacketed
  - ▶ Data includes pre and post–termination
- 

# New EPR Tan Delta – Field Test

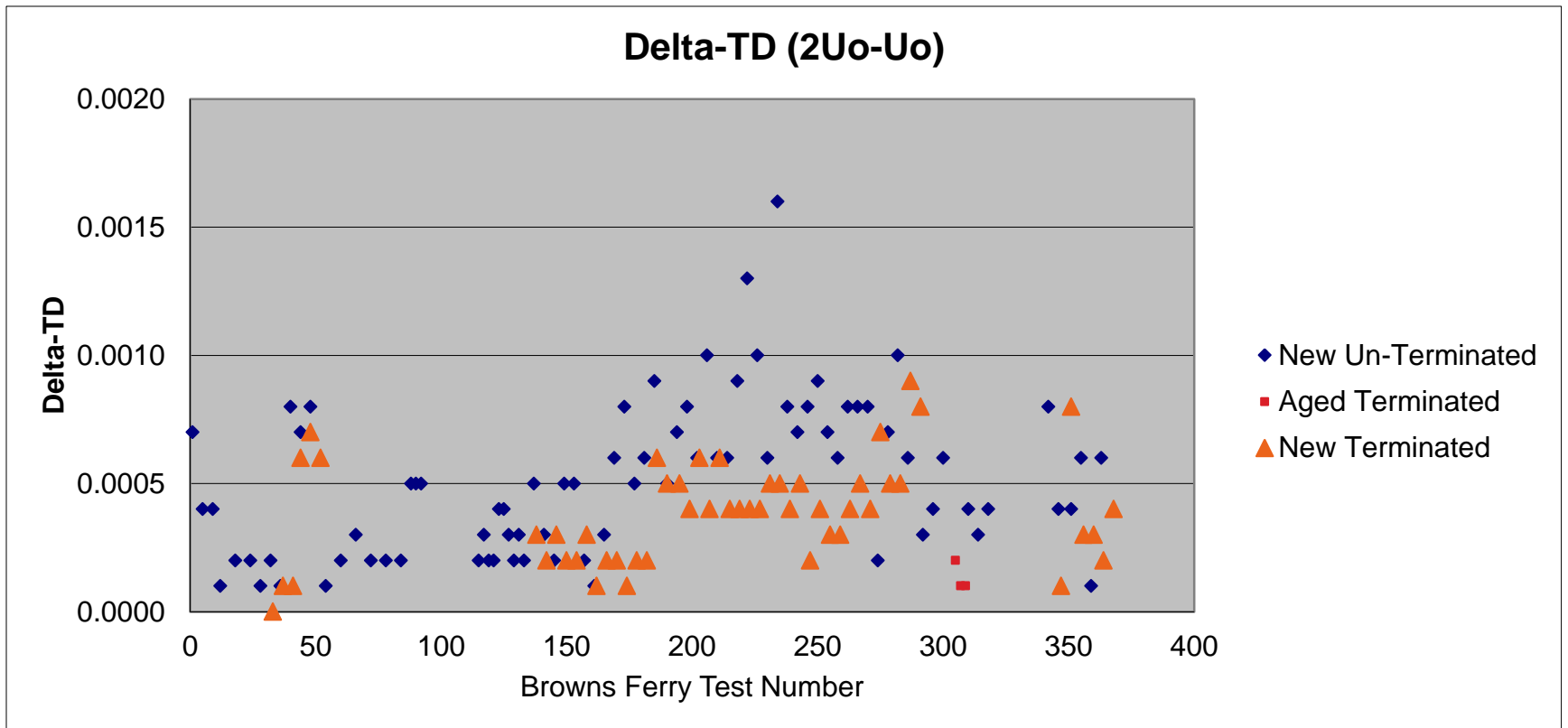


# Acceptance Criteria – Vendor A

- ▶ Short length tests were censored
  - Below the range of test set accuracy
  - No other length effect apparent
- ▶ 0.012 used as max tan delta by TVA
- ▶ EPRI added margin and selected 0.015
- ▶ No clear explanation for observed variations
  - Not related to vintage
- ▶ Recommend IEEE P400.2 replace existing single EPR table with compound specific guidance

# Delta-Tan Delta

- ▶ Same cables as above



# Delta-Tan Delta

- ▶ Testing in un-terminated state has small but favorable effect on 5 kV cables
- ▶ Effect would be expected to increase with voltage