Topics on Test Methods for Space Systems and Operations Safety: Applicability of Experimental Data

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• Perception of reality through experimentation and analysis
• Measurements, methods, and correlations with real life
• Correlating laboratory aerospace materials flammability data with data in spacecraft environments
• Phenomenological reality
• Truth
• Fact
Measurement Methods and Correlations with Real Life

- Measurement methods
  - Transient phenomena
- Correlations with real life
  - Flash point testing
  - Heat-release testing
Correlating laboratory aerospace materials flammability data with data in spacecraft environments

- NASA WSTF and Glenn Research Center (GRC) proposed approach
- Ground test conditions and spacecraft environments
- Parametric effects on flammability
- Microgravity and reduced gravity testing
Only a limited amount of microgravity or reduced gravity data can be obtained

Correlate the available information with materials characteristics to predict spacecraft extinguishment limits for other materials based on ground test information

Perhaps use inverse modeling to optimize the parameters of these correlations

- Inverse modeling is used in geophysics to infer information on Earth’s interior from physical surface measurements, not unlike inferring spacecraft materials flammability mostly from 1-g ground test data