



# **Issues Associated with Fire Probabilistic Risk Assessments (FPRA)**

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# Presentation Outline

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- **The Conceptual Challenge**
- **The Practical Challenges**
- **The Positive Outcomes**
- **The Negative Outcomes**
- **Path Forward**
- **Conclusions**

***Note: These are my Personal Views as a Safety Professional***

# Conceptual Challenge

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- **NFPA-805 developed by Experts – Expectation of Straightforward Success; Reality has Proven Otherwise**
- **Methods Not Fully Piloted – “6850” and NFPA-805 Pilots**
- **Almost Half the US Fleet Participating (Resource Intensive and Major Licensing Basis Change)**
- **Fire Risk is Small but not Insignificant**

# Practical Challenges

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- **On Average Important Fire Damage State Frequencies are Overestimated Compared to Operating Experience (OE)**
- **Thousands of Fire Damage States Needed to Develop Results which on a Relative Basis have an Engineering Basis (I.E. Make Sense)**
- **Level of Effort Extremely High**

# Positive Outcomes

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- **Improved Understanding of Fire Risk and Contributors on a Relative Basis (Scenarios versus Whole Area Damage)**
- **Improved Communications (Traditional Engineering and PRA Members) Supports Improved Decision Making**
- **Identification of Beneficial Changes to Reduce Risk and Improve Defense in Depth/Margins**
- **Identification of Research and Development Needs to Improve Realism/Decision Making**

# Negative Outcomes

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- **Cost, Frustration and Reduced Confidence in Risk Informed Applications (Too Complex)**
- **Unrealistic Characterization of Risk**
- **Inefficient Use of Resources and Funds?**
- **Other than Insights from the Fire PRA were Other Deterministic Aspects of NFPA-805 Worth the Effort?**

# Path Forward

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- **Develop Lessons Learned and Implement**
- **Conduct the R&D Appropriate to Achieve Realism and Characterize Uncertainties Objectively**
- **Key Topic is the Relationship among**
  - **Fire Frequency**
  - **Fire Size and Development**
  - **Detection and Suppression**

# Conclusions

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- **I, as Well as Other Senior Industry Members, Firmly Believe FPRA Methods Used in NFPA-805 are Conservative Overall**
- **Conservatism is Prudent in Decision-making, however:**
  - **Results should Comport with Operating Experience**
  - **Realism is Needed to Ensure Proper Safety Focus and Increase Confidence in Decision-making**
- **Costs Must Be Reduced to Support Improved Use of Risk Insights**



# References

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- **Nuclear Energy Institute Letter, Transmittal of NEI Report, “Roadmap for Attaining Realism in Fire PRAs - December 2010”, Nuclear Energy Institute, dated December 6, 2010 (ML103430372)**
- **ACRS Letter, Said Abdel-Khalik, Chairman to The Honorable Gregory B. Jaczko, “CURRENT STATE OF LICENSEE EFFORTS TO TRANSITION TO NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARD 805”, dated February 17, 2011 (ML110460631)**