



*Fire Protection Engineering Distance  
Learning Programs*

*NEI Fire Protection Information Forum*

*September 22, 2009*

**J. Milke, Professor and Assoc. Chair**

**Department of Fire Protection Engineering**

**University of Maryland, USA**



# Programs

---

- ❖ Master of Engineering
- ❖ Graduate Certificate
- ❖ Selected Courses



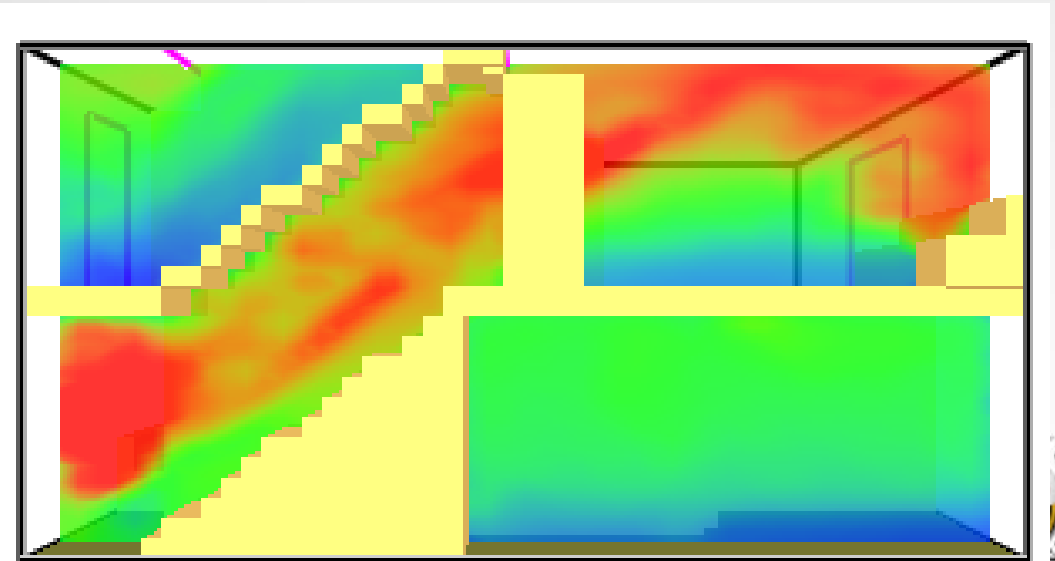
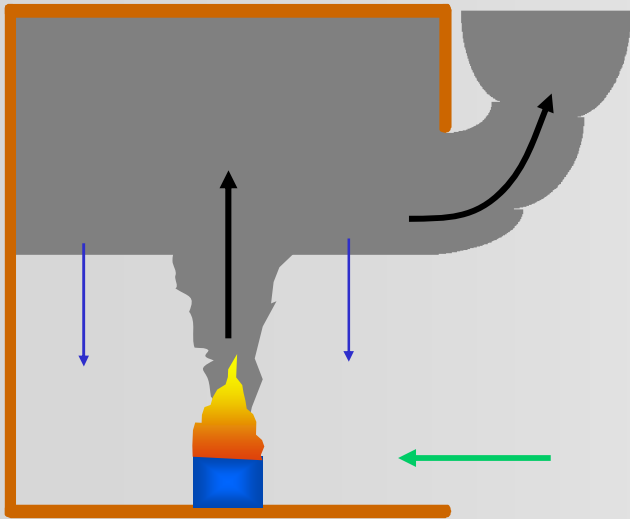
# Courses

- ❖ Advanced Fire Modeling
- ❖ Smoke Detection and Management
- ❖ Advanced Fire Suppression
- ❖ Forensic Fire Analysis
- ❖ Human Response to Fire
- ❖ Procedures of Structural Fire Protection
- ❖ Performance-Based Design
- ❖ Advanced Fire Risk Modeling
- ❖ Advanced Fire Dynamics
- ❖ Fire Assessment Methods



# Fire modeling

- ❖ Estimate characteristics of fire exposure
  - Temperatures or heat flux in vicinity of key components
  - Duration of fire exposure
  - Application of models – FAST, FDS. Simulation of fire development in department offices



# Advanced Fire Risk Modeling

## Module 2: Application of Quantitative Risk Assessment

- Process outlined in NUREG/CR-6850
- ❖ Risk indices considered:
  - Core Damage Frequency, CDF - Expected number of reactor core damage events per unit of time.
  - Large Early Release Frequency, LERF - Expected number of large early radiation releases per unit of time.



# Module 2, Advanced Fire Risk Modeling

- ❖ Define Fire Risk
- ❖ Define Risk Acceptability Thresholds
- ❖ Develop a Fire Risk Modeling Approach
- ❖ Identify Hazards and Barriers
- ❖ Identify and Describe Fire Scenarios
- ❖ Risk Quantification
- ❖ Uncertainty and Sensitivity Analysis
- ❖ Documentation



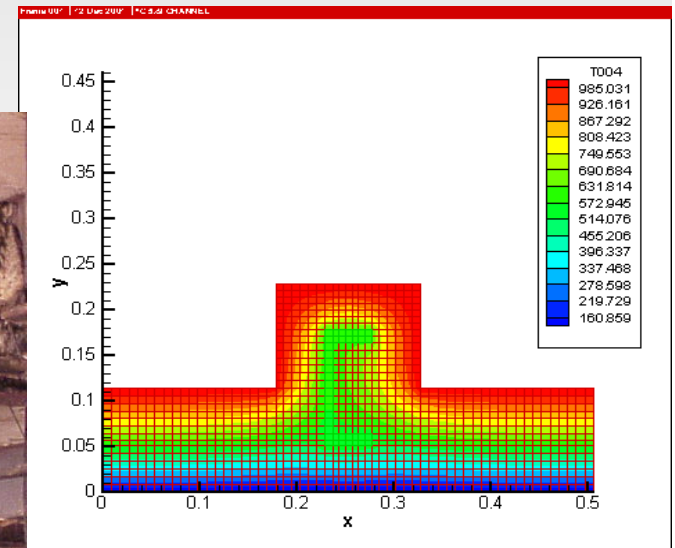
# Develop a Fire Risk Modeling Approach

- ❖ 8 Steps (simplification and consolidation of the 16 steps described in NUREG/CR-6850)
  - Step 1: Plant Partitioning
  - Step 2: Component Selection
  - Step 3: Cable Selection and Cable Routing
  - Step 4: Qualitative Screening
  - Step 5: Building the Logic Model
  - Step 6: Identify Ignition Sources and Determine Fire Ignition Frequencies
  - Step 7: Preliminary Quantitative Screening
  - Step 8: Detailed Scenario Analysis



# Structural fire protection

- ❖ Effects of elevated temperatures on structural materials; steel, concrete, wood, gypsum, glass and reinforced plastics.
- ❖ Analytical methods to evaluate fire resistant design of structures
- ❖ Computer simulation of response of structural elements
- ❖ Conduct experiment of small-scale timber beam





# Master of Engineering

- ❖ 10 courses (30 credits)
  - 2 courses offered per term, 4 terms per year (each term is 12 weeks long)
- ❖ No Research Component
- ❖ No Thesis/Scholarly Paper
- ❖ No Comprehensive Exam



# Graduate Certificate in Engineering

---

- ❖ Four courses

- Smoke Detection/Management
- Advanced Fire Modeling
- Advanced Fire Dynamics
- Advanced Fire Suppression



# Admissions

---

- ❖ Graduate School Application
- ❖ Accredited Baccalaureate Degree (Engineering or Related Discipline)
- ❖ Transcripts (at least 3.0 GPA)
- ❖ 3 Letters of Recommendation
- ❖ GRE **Not** Required



# Format of Distance Courses

- ❖ Web-based format
  - Written material supplements texts or journals to be read
  - Video and animations are available
  - No on-campus work required
- ❖ Students complete assignments during week around your schedule
  - Individual and group assignments, similar to on-campus courses
- ❖ Only scheduled event is chat session (once or twice per week) (transcript is available for anyone not in attendance)



# Distance Faculty

- ❖ Jim Milke, Ph.D., P.E., Professor and Director - *Smoke Detection and Management*
- ❖ Arnaud Trouvé, Associate Professor, Ph.D. – *Advanced Fire Modeling*
- ❖ Adjunct Faculty
- ❖ Douglas J. Carpenter, P.E. (Maryland) – *Fire Dynamics*
- ❖ Steven Gwynne, Ph.D. (Colorado & UK) – *Human Response to Fire*
- ❖ Morgan J. Hurley, P.E. (Maryland) - *Performance-Based Design*
- ❖ David J. Icové, Ph.D., P.E. (Tennessee) - *Forensic Fire Analysis*
- ❖ Marc L. Janssens, Ph.D. (Texas) - *Fire Assessment Methods*
- ❖ Francisco Joglar, Ph.D., P.E. (Virginia) - *Advanced Fire Risk Modeling*
- ❖ David A. Purser, Ph.D. (UK) – *Human Response to Fire*
- ❖ Richard J. Roby, Ph.D., P.E. (Maryland) – *Fire Dynamics*
- ❖ Eric R. Rosenbaum, P.E. (Maryland) - *Performance-Based Design*
- ❖ Jason Sutula, Ph.D., (Maryland) - *Advanced Fire Suppression*



# More information

- ❖ See exhibit
- ❖ Website: <http://www.oaee.umd.edu/grad/fire/>
- ❖ Contact Jim Milke
  - [milke@umd.edu](mailto:milke@umd.edu)
  - 301 405 3995

