



Fire Modeling

Fire Protection Services

- + Fire Protection Program Development
- + Fire Hazards Analysis
- + Fire & Probabilistic Risk Assessments
- + Life Safety Reviews
- + **Fire Modeling**
- + Code Consulting
- + Sprinkler System Design
- + Fire Alarm Design
- + Special Hazards System Design
- + Water Supply Testing and Evaluation
- + Project Specifications
- + Construction Observation
- + Computer-Aided Design (CAD)
- + Fire Safety Plans/Evacuation Procedures
- + Fire Induced Plant Shutdown Analyses

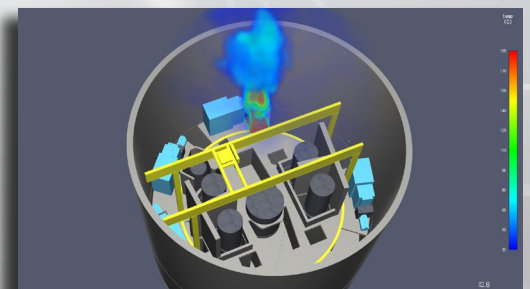


Application

EPM has been utilizing fire modeling techniques in the support of power plant transition to risk-informed, performance-based fire protection programs. Our extensive experience with verifying and validating fire models provides reliable prediction of the consequences of fire.

EPM's Fire Protection Engineers use this capability to:

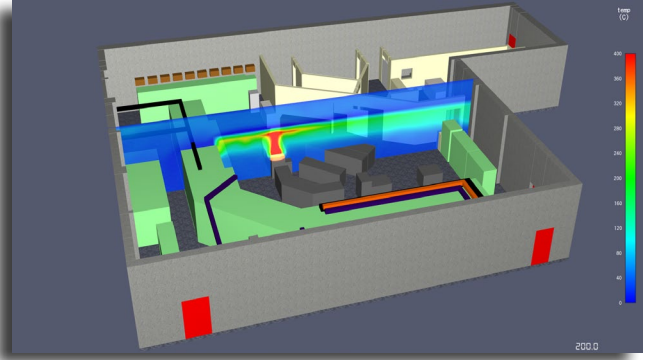
- Identify if and when critical equipment could be damaged by a fire to support safe shutdown, NFPA 805, Fire PRA, address multiple spurious operations (RIS 04-03), 86-10 evaluations, exemptions, or any other type of analysis.
- Determine if structural building elements will fail due to fire effects (with or without fire-proofing).
- Identify the need for and type of fixed fire detection and suppression systems given potential fire scenario impacts.
- Determine optimum detection and suppression system coverage to meet performance goals.
- Evaluate replacement protection options for Halon and CO2 suppression.
- Justify code compliance equivalencies for fire barriers and fire protection systems.
- Evaluate tenability to support operator performance of recovery actions.
- Establish a design basis fire by determining possible fire spread to area combustibles given site specific conditions such as material properties, room geometry ventilation, etc.
- Authored multiple guidance documents for the nuclear industry with regards to fire modeling methods.



EPM's Background and Experience

EPM's fire protection engineers have extensive fire modeling experience within the nuclear industry. This includes fire modeling analysis **since the 1990s** for over **30 nuclear plants in the United States, Canada, Asia and Europe**. EPM's fire modeling experts are experienced with state-of-the-art fire analysis techniques and guidance and **have prepared thousands of fire models and fire scenarios** in support of risk-informed, performance-based fire protection analyses, such as NFPA 805 projects, Fire Probabilistic Risk Assessments (PRA), Significance Determination Process (SDP), and safe shutdown analyses.

EPM is trained, capable and experienced with sophisticated fire modeling codes such as NIST's Fire Dynamics Simulator (FDS), Consolidated Model of Fire and Smoke Transport (CFAST), Pyrosim, NUREG-1805 Fire Dynamics Tools (FDTs), and EPRI FIVE Methodology (EPRI TR-100370). EPM's fire modelers use fire models to predict fire conditions such as flame height, plume temperature, thermal radiant exposure, ceiling jet temperature, and hot gas layer conditions to determine whether targets important to risk and safety are located within a fire's zone of influence. Fire models are also used to estimate sprinkler suppression and heat/smoke detection timing and effectiveness.



EPM has developed its own suite of fire modeling tools. The tools use plant specific information related to ignition sources, combustibles, detection & suppression systems, and targets to calculate severity factors, fire growth analyses, zones of influence, hot gas layer potential, and fire scenario frequency details. For each of these workbooks EPM has completed validation and verification (V&V) reports which document the technical bases for the calculations.

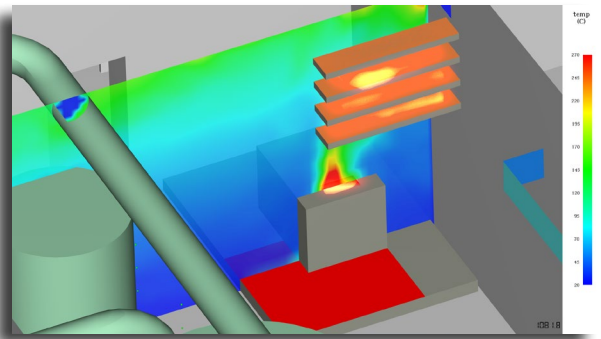
EPM Offers

Proven Experience:

EPM began using this approach when the Canadian Nuclear Safety Commission requested that all nuclear power plants in Canada perform analyses demonstrating safe shutdown capability during a fire, at a time when there were no concrete rules or guidance available to perform such a safe shutdown analysis. EPM used the techniques that were being developed in NFPA 805 and tailored them for use at the CANDU reactors.

Integration using EPM's Genesis Solution Suite® Software

- EPM's own proprietary software that was expanded to integrate NFPA 805 and NUREG/CR-6850 processes.
- Suite of integrated applications that work together to perform activities such as cable selection and cable routing.
- Licensed at 49 units across the U.S., as well as in the U.K., South Korea, and Canada



Contact Us

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