


# Module Descriptions for the 2008 NRC-RES/EPRI Fire PRA Course

Each session of the 2008 Fire Probabilistic Risk Assessment (PRA) Course will offer three modules, each of which will include in-depth technical presentations, hands-on sample problem(s), and discussions of the latest fire PRA issues resolved in the Frequently Asked Questions (FAQ) program on National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants" (NFPA 805). The three modules will be taught simultaneously during each week-long session, and each module will extend throughout the entire week. *An individual can attend only one module during each session*, but may register for both sessions to attend two different modules. (See our [electronic registration form](#) for available selections.)

For additional information about the structure and content of this course, see the [Course Agenda](#)  and the following links on this page:

- [Module 1](#) - PRA/HRA
- [Module 2](#) - Electrical Analysis
- [Module 3](#) - Fire Analysis
- [Additional Information](#)

## Module 1: PRA/HRA

This module covers the technical tasks associated with developing both system and operator response to a fire. Specifically, this module covers Sections 2, 4, 5, 7, 12, 14, and 15 in Volume 2 of [NUREG/CR-6850/EPRI 1011989](#), "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities." This module is geared toward PRA practitioners, who are responsible for the systems modeling and human reliability analysis (HRA) aspects of the fire PRA. Specifically, participants in this module should possess the following general knowledge:

- concepts of PRA and HRA as applied to nuclear power plants, including typical approaches, modeling techniques (event trees, fault trees, interfaces between PRA and HRA), and the quantification of PRA models
- plant systems typically found in nuclear power plants (a simplified, but reasonably realistic example of a few plant systems will be used to demonstrate the methodology)
- piping and instrumentation diagrams (P&IDs) and their use in developing PRAs

## Module 2: Electrical Analysis

This module covers technical tasks associated with analyzing fire-induced circuit failures in support of fire PRA analyses. Specifically, this module covers Sections 3, 9, and 10 in Volume 2 of [NUREG/CR-6850/EPRI 1011989](#). This module is geared toward PRA practitioners and fire safe-shutdown analysts with a practical understanding of the concepts and methods of fire-induced circuit failure analysis within the context of fire PRA, or post-fire safe shutdown circuit failure assessments conducted in accordance with [Appendix R](#) to Title 10, Part 50, of the Code of Federal Regulations ([10 CFR Part 50](#)). Specifically, participants in this module should possess the following knowledge:

- general circuit design and operational control for typical plant equipment
- basic circuit analysis techniques for identifying and classifying fire-induced circuit failure modes
- typical electrical drawings, including one-line diagrams, schematic diagrams, electrical block diagrams, wiring/connection diagrams, raceway layout drawings, instrument loop diagrams, etc.

- cable and raceway, Appendix R post-fire safe-shutdown, and fire PRA database structures and software
- Appendix R post-fire safe-shutdown circuit analysis
- progression of events stemming from the EPRI/NRC cable fire testing to characterize fire-induced circuit failures (historical perspective)
- emerging issues and challenges associated with the analysis of multiple spurious operations

### Module 3: Fire Analysis

This module covers technical tasks associated with plant partitioning, fire frequency analysis, and the development and analysis of fire scenarios from fire ignition to target impact and fire suppression. Specifically, this module covers Sections 1, 6, 8, and 11 in Volume 2 of [NUREG/CR-6850/EPRI 1011989](#). This module is suited for PRA practitioners responsible for treating those aspects of the fire PRA specifically related to the fire growth and damage assessment tasks. Specifically, participants in this module should possess the following knowledge:

- fire frequency calculation process, as practiced in fire PRA
- general fire protection features and systems as typically implemented at a NPP
- use of fire models in support of the fire PRA (proficient fire modeling expertise is *not* required)
- fire behavior and the parameters most important to a fire growth and damage analysis [e.g., concepts such as fire spread, heat release rate (HRR), target response, and fire suppression and detection analyses]

### Additional Information

- Computers are not needed for participation in this course.
- Participants should prepare for the course by reading the indicated sections of [NUREG/CR-6850/EPRI 1011989](#) (see the module descriptions above). This report may also be obtained from the [EPRI Web site](#). [EXIT](#)
- This training will be treated as a public meeting.