

Risk-Informed, Performance-Based Fire Protection for U. S. Commercial Nuclear Power Plants

John Hannon, Chief
Plant Systems Branch
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

Fire & Safety Conference
Nuclear Energy International
Munich 11-12, 2004
February 2004

United States Nuclear Regulatory Commission
Washington, DC 20555-0001



United States Nuclear Fire Protection

Background

- 1971 - AEC Fire Protection General Design Criteria
- 1975 - Browns Ferry Fire
- 1980 - 10 CFR 50.48, Appendix R
- 1998 - Reg. Guide 1.174, Probabilistic Risk Assessment
- 2001 - National Fire Protection Association, NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants

United States Nuclear Regulatory Commission

Rulemaking Objectives

- Maintain Public Health and Safety
- Reduce Regulatory Burden
- Risk-Inform the Fire Protection Requirements
- Endorse a National Consensus Standard
- Stakeholder Involvement

NFPA 805

- Sets performance goals and criteria
- Goals and criteria are achieved using risk-informed, performance-based or a deterministic approach
- Focus on risk significant issues
- Maintains a core FP program
- Endorses a National Fire Protection Association Consensus Standard
- Reduces unnecessary regulatory burden

Rule Structure

- Adds NFPA 805, 2001 edition into the regulations (10 CFR 50.48) as a voluntary alternative to App. R
- Regulation identifies 7 exceptions to the standard
- Requires license amendment to adopt NFPA 805
- Must complete fire-area by fire-area evaluations
- Decommissioning plants may also choose to comply with NFPA 805 criteria

Rule Structure

- Evaluations must be documented and retain for NRC inspection
- Alternatives to NFPA 805 base-line requirements require a license amendment
- NRC pre-approval of methods not required, licensee may use these at “risk”
- NRC working to on new fire PSA methods and V&V fire models

Current Status

- Proposed rule issued November 2002
- Comment period ended January 2003
- Publish the Final Rule Summer 2004
(Tentative)
- Draft Regulatory Guide Summer 2004