

## FIRE PROTECTION PROGRAM

MC3796, MC4011, MC4395, MC5630, MC5660, MC6921  
MD1545, MD3911

Last Update: 05/13/10  
Lead NRR Division: DRA  
Supporting Divisions: DIRS, DPR, and  
DRASP (RES)  
Supporting Offices: OE, OGC, RES

MILESTONES	DATE (T/C)
<b>ITEM I: RISK-INFORMED PERFORMANCE-BASED RULE (NFPA 805) IMPLEMENTATION</b>	
1. Transmit DRA request to revise enforcement discretion policy for NFPA 805 plants (conditional to receiving NEI's request by 02/28/07)	(C)
2. Conduct at least two observation visits at NFPA 805 pilot plant licensees sites between 10/1/06 and 9/30/07	(C)
3. Issue at least two lesson learned trips reports to share insights gained from NFPA 805 pilot plants with non-NFPA 805 pilot plant licensees	(C)
4. Issue a RIS to communicate resolution of emerging issues identified and resolved during the pilot implementation process.	12/07
5. Resolve (complete Branch Chief Memo to File) FAQ-5, 8, 11, 12 and low power shutdown risk issue in support of 805 plants	09/07
6. Conduct at least 10 public meetings or telephone conferences (between 10/01/06 and 9/30/07) with NEI and licensees adopting NFPA 805 in support of the FAQ process	(C)
7. Develop Draft Standard Review Plan for NFPA 805 plants	12/07
8. Conduct at least two workshops for regional inspectors between 10/1/06 and 12/31/07	12/07
<b>ITEM II: POST-FIRE SAFE-SHUTDOWN CIRCUIT ANALYSIS RESOLUTION</b>	
1. Hold public meeting with stakeholders to convey plan for high level staff strategy for closure of multiple spurious actuations	(C)
2. Transmit DRA request to OE to revise enf. discretion policy for non-NFPA 805 plants	(C)

MILESTONES	DATE (T/C)
3. Revise and issue RIS 2004-03Rev. 1 to incorporate insights gained from CAROLFIRE	09/07
4. Provide input to inspection branch to update inspection guidance using insights gained from CAROLFIRE and Commission SRM on SECY-06-0196	09/07
5. Conduct staff audits(if necessary) at non-NFPA 805 plants to understand licensee analysis methods used to assess multiple spurious actuations	N/A
6. Hold public workshop with stakeholders	(C)
7. Develop or endorse methods for non-805 plants to assess multiple spurious actuations and complete response to Commission WITTS item	12/07
<b>ITEM III: POST-FIRE OPERATOR MANUAL ACTIONS</b>	
1. Address comments on Draft NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions In Response to Fire"	(C)
2. Seek and receive CRGR approval to issue NUREG-1852	09/07
3. Develop framework to verify use of operator manual actions is in compliance with regulations and licensees approved fire protection program	09/07
<b>ITEM IV: FIRE BARRIER ISSUES RESOLUTION</b>	
1. Hemyc and MT, fire barrier performance qualification	
◦ Complete review of responses from all licensees on GL 2006-03 (Complete 75% by 09/30/07)	12/07
◦ Work with Regions to develop Closeout Plan for all Hemyc/MT URIs at regions	09/07
<b>ITEM V: EMERGING FIRE PROTECTION ISSUES RESOLUTION</b>	
1. Information Notice on "Potential Failure of All Control Rod Groups to Insert in a Boiling Water Reactor Due to a Fire"	
◦ Issue IN	(C)
2. Information Notice on, "Faulty Active Fire Protection Equipment	
◦ Complete IN turnover to DPR/PGCB for issuance	(C)
3. Information Notice on, "Potential Fire Hazard with Flame Retardant String Reinforced Polyethylene Film	
◦ Complete IN turnover to DPR/ PGCB for issuance	(C)
<b>ITEM VI: REGULATORY GUIDANCE UPDATE</b>	

MILESTONES	DATE (T/C)
1. Update RG 1.189, "Fire Protection for Nuclear Power Plants"	(C)
2. Update SRP Section 9.5.1, "Fire Protection Program"	(C)

Description: Today the fire protection programs (FPPs) at U.S. nuclear power plants have the primary goals of minimizing both the probability of occurrence, and consequences of fire. To meet these goals, the FPPs are designed to provide reasonable assurance that a fire will not prevent the performance of necessary safe shutdown functions and will not significantly increase the risk of radioactive releases to the environment. The primary FPP objectives for operating reactors are to:

Prevent fires from starting,  
Detect, rapidly control, and promptly extinguish those fires that do occur, and  
Protect structures, systems, and components important to safety so that a fire that is not promptly extinguished will not prevent the safe shutdown of the plant.

The FPP objectives at plants that have permanently ceased operations are to:

Reasonably prevent fires from occurring,  
Rapidly detect, control and extinguish those fires that do occur that could result in a radiological hazard, and  
Ensure that the risk of fire-induced radiological hazards to the public, environment and plant personnel is minimized.

The challenges within the FPP stem from (1) the fact that we have prescriptive regulations that are subject to different interpretations and are not always able to be enforced in a clear and consistent way, and (2) the fact that licensees have varying degrees of specificity in their licensing basis and in some cases are substantially different, which can also lead to different interpretations of regulatory intent. The activities described below address these challenges with the objective of achieving the strategic plan.

**ITEM I: RISK-INFORMED PERFORMANCE-BASED RULE (NFPA 805) IMPLEMENTATION**

Historical Background: The goal of revising Title 10 of the *Code of Federal Regulations* (CFR) 50.48 (10 CFR 50.48) is to allow licensees to adopt a risk-informed, performance-based approach to fire protection as described in the consensus standard National Fire Protection Association (NFPA) 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants." The revised rule provides a means to establish a well-defined fire protection licensing bases and enables licensees to manage their fire protection programs with minimal regulatory intervention. Nuclear Energy Institute (NEI) developed NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program under 10 CFR 50.48(c)," and NEI 00-01, Rev. 1, "Guidance for Post-Fire Safe Shutdown Analysis". The staff endorsed this guidance in the final regulatory guide (RG) 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," with some exceptions.

Proposed Actions: N/A

Originating Document: SECY Paper 00-0009, "Rulemaking Plan, Reactor Fire Protection Risk-Informed, Performance-Based Rulemaking", dated January 2000.

Regulatory Assessment: See Historical Background.

Current Status: This Action Plan has been superseded by SECY-08-171, Fire Protection Closure Plan, "Stabilizing Fire Protection Regulatory Infrastructure" (Accession No. ML082840659).

NRR Lead Branch Chief: Alex Klein, AFPB, 415-2822

NRR Technical Contacts: Paul Lain, AFPB, 415-2346  
Ray Gallucci, AFPB, 415-1255  
Charles Moulton, AFPB, 415-2751  
Dan Frumkin, AFPB, 415-2280

RES Technical Contact: Mark Salley, DRASP/OERA/F, 415-2840

#### References:

Regulatory Guide 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants", dated May 2006.

NEI 04-02, Rev. 1, "Guidance for Implementing a Risk-informed, Performance-Based Fire Protection Program Under 10 CFR 50.48 (c)", dated September 2005

NEI 00-01, Rev. 1, "Guidance for Post-Fire Safe Shutdown Analysis," dated January 2005.

NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," dated September 2005.

SECY Paper 00-0009, "Rulemaking Plan, Reactor Fire Protection Risk-Informed, Performance-Based Rulemaking", dated January 2000.

NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, National Fire Protection Association, Quincy, Massachusetts.

Staff Requirements Memorandum M040511A, "Affirmation of SECY-04-0050 - Final Rule: Revision of 10 CFR 50.48 to Allow Performance-based Approaches Using National Fire Protection Association (NFPA) Standard 805, "Performance-based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition", dated May 2004.

"Risk-Informed, Performance-Based Fire Protection Transition Pilot-Plant Observation Visit - Oconee Nuclear Station and Harris Nuclear Plant," dated November 10, 2005. (ML060250034)

"NFPA 805 Transition Pilot Program Observation Visit November 2005 Trip Report," dated January 27, 2006. (ML060250033)

"NFPA 805 Second Pilot Observation Visit Trip Report, March, 2006," dated August 23, 2006. (ML061520285)

## **ITEM II: POST-FIRE SAFE-SHUTDOWN CIRCUIT ANALYSIS RESOLUTION**

Historical Background: The goal of the Post-Fire Safe-Shutdown Circuit Analysis program is to clarify regulatory expectations with respect to circuit analyses and provide guidance to licensees and NRC inspectors on a risk-informed approach to inspection of post-fire safe-shutdown spurious actuations resulting from failure of circuits. The guidance documents, developed in cooperation with industry, will be used to bring clarity to a long-standing unresolved issue.

Proposed Actions: N/A

Originating Document: Information Notice 99-17, "Problems Associated with Post-Fire Safe-Shutdown Circuit Analysis", dated June 1999.

Regulatory Assessment: See Historical Background.

Current Status: This Action Plan has been superseded by SECY-08-171, Fire Protection Closure Plan (Accession No. ML082840659).

NRR Lead Branch Chief: Alex Klein, AFPB, 415-2822

NRR Technical Contacts: Ed McCann, AFPB, 415-1218  
Dan Frumkin, AFPB, 415-2280  
Ray Gallucci, AFPB, 415-1255

RES Technical Contact: Mark Salley, DRASP/OERA/F, 415-2840

#### References:

NRC Bulletin 75-04, "Cable Fire at Browns Ferry Nuclear Power Station", dated March 1975.

NRC Bulletin 92-01, "Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free From Fire Damage", dated June 1992.

Information Notice 84-09, "Lessons Learned From NRC Inspections of Fire Protection Safe Shutdown Systems (10 CFR 50, Appendix R)", dated February 1984.

Information Notice 84-09r1, "Lessons Learned From NRC Inspections of Fire Protection Safe Shutdown Systems (10 CFR 50, Appendix R)", dated March 1984.

Information Notice 99-17, "Problems Associated with Post-Fire Safe-Shutdown Circuit Analysis", dated June 1999.

"Circuit Analysis-Failure Mode and Likelihood Analysis," A Letter Report to USNRC, Sandia National Laboratory, Albuquerque, New Mexico, ADAMS Accession # ML010450362, dated May 8, 2000.

NUREG/CR-6776, "Cable Insulation Resistance Measurements Made During Cable Fire Tests," Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC, dated June 2002.

NUREG/CR-6834, "Circuit Analysis - Failure Mode and Likelihood Analysis," Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC, dated September 2003.

NEI 00-01, Rev. 0, "Guidance for Post-Fire Safe Shutdown Analysis," dated May 2003.

NEI 04-06, Rev. G, "Guidance for Self-Assessment of Circuit Failure Issues", dated March 2004.

Regulatory Issue Summary 2004-03, "Risk-Informed Approach for Post-Fire Safe-Shutdown Associated Circuit Inspections", dated March 2004.

Regulatory Issue Summary 2004-03, Rev. 1, "Risk-Informed Approach for Post-Fire Safe-Shutdown Circuit Inspections", dated December 2004.

Regulatory Issue Summary 2005-30, "Clarification of Post-Fire Safe-Shutdown Circuit Regulatory Requirements", dated May 2005.

SECY 2006-0196, "Issuance of Generic Letter 2006-XXXX, "Post-Fire Safe-Shutdown Circuits Analysis Spurious Actuations," dated September 2006.

SRM SECY 2006-0196, "Issuance of Generic Letter 2006-XXXX, "Post-Fire Safe-Shutdown Circuits Analysis Spurious Actuations," dated December 2006.

NUREG/CR-XXXX, "CAROLFIRE Test Report Volume 1: General Test Descriptions and the Analysis of Circuit Response Data," Revision: Draft Revision 1, dated January 29, 2007. (ML063620012)

### **ITEM III: POST-FIRE OPERATOR MANUAL ACTIONS**

Historical Background: The goal of the Operator Manual Actions Rulemaking is to revise Appendix R, Section III.G.2 and add new Section III.P to allow ex-Control Room operator manual actions as a Section III.G.2 compliance option if they conform to criteria to demonstrate their acceptability and meet the requirement for fire detectors and automatic fire suppression systems. The revised rule will provide reasonable assurance that post-fire operator manual actions will maintain the ability to achieve safe shutdown. Guidance for evaluating the actions will be provided in a Reg. Guide so that they can be uniformly evaluated by licensees and inspectors. SECY 03-0100 provided the primary purposes for the rulemaking. Based on public comments on the proposed rule, the staff will recommend withdrawal of the proposed rule. The staff briefed NRC upper management and the Commission Technical Assistants in August 2005 to convey our recommendation. The staff held a public meeting in September 2005 with the public to convey the same recommendation.

The staff worked on a policy paper to recommend withdrawal of the proposed rule. This policy paper was provided to the Commissioners in January 2006. By a 5-0 vote, the Commissioners approved the staff proposals to withdraw the proposed rule. Concurrent with the policy paper development, the staff worked on elements of the closure plan in the event the Commission accepts the recommendation. One closure plan element is a Regulatory Issue Summary reiterating regulatory compliance expectations. The Commission had no objection to issue the proposed Regulatory Issue Summary.

For further information, see Attachment 2, "NRR Rulemaking" DRIP RM#616.

Proposed Actions: N/A

Originating Document: SECY Paper 03-0100, "Rulemaking Plan on Post-Fire Operator Manual Actions", dated June 2003.

Regulatory Assessment: See Historical Background.

Current Status: This Action Plan has been superseded by SECY-08-171, Fire Protection Closure Plan (Accession No. ML082840659).

NRR Lead Branch Chief: Alex Klein, AFPB, 415-2822

NRR Technical Contacts: Phil Qualls, AFPB, 415-1849

RES Technical Contact: Jose Ibarra, DRASP/PRA/HF, 415-8742

#### References:

Letter, NRC Chairman to Congressman Markey and Dingell, dated May 16, 2004.

SECY Paper 03-0100, "Rulemaking Plan on Post-Fire Operator Manual Actions", dated June 2003.

SRM "Staff Requirements - SECY-04-0233 - Proposed Rulemaking - Post-Fire Operator Manual Actions (RIN 3150 AH-54)", dated January 18, 2005.

Communication Plan for Fire Protection Operator Manual Actions, dated September 7, 2005.

Draft Regulatory Guide DG-1136, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire", dated February 2005.

Summary of Meeting to Receive Stakeholder Feedback, dated May 16, 2005.

Public Comments on Proposed Rule, dated May 16, 2005.

SECY Paper 06-0010, "Withdraw Proposed Rulemaking - Fire Protection Program Post-Fire Operator Manual Actions", dated January 12, 2006.

SRM "Staff Requirements - SECY-06-0010, "Withdraw Proposed Rulemaking - Fire Protection Program Post-Fire Operator Manual Actions", dated February 8, 2006.

NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire - Draft Report for Comment, dated October 2006. Draft for public comments.

Federal Register Notices requesting public comments on Draft NUREG-1852, dated October 12, and November 21, 2006.

Summary of Meeting Discussing Draft NUREG-1852, dated December 20, 2006.

#### **ITEM IV: FIRE BARRIER ISSUES RESOLUTION**

Historical Background: Hemyc and MT are electrical raceway fire barrier systems (ERFBS) installed to meet the 1-hour (Hemyc) and 3-hour (MT) separation requirements of 10 CFR 50, Appendix R. NRC inspections identified weaknesses in the tests that were performed to support the fire rating of these barriers. RES performed confirmatory testing on multiple configurations of 1-hour Hemyc and 3-hour MT fire barrier systems to determine if the material can be rated as a fire barrier based on approved test methods. The test results revealed that Hemyc and MT fire barrier systems failed to provide the protective function intended for compliance with fire protection regulations, for the configurations tested using staff-approved test methods.

Proposed Actions: N/A

Originating Document: Not applicable.

Regulatory Assessment: See Historical Background.

Current Status: This Action Plan has been superseded by SECY-08-171, Fire Protection Closure Plan (Accession No. ML082840659).

NRR Lead Branch Chief: Alex Klein, AFPB, 415-2822

NRR Technical Contact: Dan Frumkin, AFPB, 415-2280

RES Technical Contact: Mark Salley, DRASP/OERA/F, 415-2840

References:

Information Notice 2005-07, "Results of Hemyc Electrical Raceway Fire Barrier System Full Scale Fire Testing," date April 2005

Generic Letter 2006-03, "Potentially Nonconforming Hemyc and Mt Fire Barrier Configurations," dated April 2006.

"Updated Test Plan for Hemyc 1-Hour and M.T. 3-Hour Fire Rated Electrical Raceway Fire Barrier System (ERFBS) Testing," dated April 12, 2005. (ML051040157)

Public Meeting Handouts, "Hemyc & MT Electrical Raceway Fire Barrier Systems (ERFBS) Confirmatory Fire Performance Testing," dated April 29, 2005. (ML051310006)

"Completion of RES/DRAA/PRAB Fire Testing and Reports for Hemyc and MT Electrical Raceway Fire Barrier Systems (ERFBS)," dated June 21, 2005. (ML051720410)

#### **ITEM V: EMERGING FIRE PROTECTION ISSUES RESOLUTION**

Historical Background: To facilitate the resolution of emerging issues, a protocol is established between the NEI/industry and the NRC. This process is intended to identify emerging fire protection generic issues, discuss priorities and schedules, and facilitate improved coordination without affecting NRC's oversight responsibility. Issues are tracked, prioritized, and given an action status by the responsible party. Stakeholders are kept informed through publicly issued meeting summaries. This process was modeled after the protocol applied in the resolution of steam generator issues.

Proposed Actions: N/A

Originating Document: Not applicable.

Regulatory Assessment: See Historical Background.

Current Status: This Action Plan has been superseded by SECY-08-171, Fire Protection Closure Plan (Accession No. ML082840659).

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RES Technical Contact: Mark Salley, DRASP/OERA/F, 415-2840

#### References:

Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis", dated July 1998.

Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety", dated December 1998.

Information Notice 03-19, "Unanalyzed Condition of Reactor Coolant Pump Seal Leakoff Line During Postulated Fire Scenarios or Station Blackout", dated October 2003.

NRC Inspection Manual, Chapter 0609, Appendix F, "Determining Potential Risk Significance of Fire Protection and Post-Fire Safe Shutdown Inspection Findings", dated February 27, 2001.

NUREG-0800, Section 9.5.1, Rev. 4, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants Fire Protection Program", dated October 2003.

Test Plan for Heymc and MT, Fire Barrier Performance, Package.

Information Notice 2005-07, "Results of Hemyc Electrical Raceway Fire Barrier System Full Scale Fire Testing," dated April 2005.

Generic Letter 2006-03, "Potentially Nonconforming Hemyc and Mt Fire Barrier Configurations," dated April 2006.

Industry Position Paper on Use of Epoxy Coatings, dated June 28, 2004. (ML041980452)

NRC Response to Industry Paper on Use of Epoxy Coatings, "Fire Protection Issue Management Evaluation of Epoxy Coatings in Nuclear Plant," dated August 8, 2005. (ML052020025)

NRC Staff Review of the Westinghouse Owners Group (WOG) Request for Enforcement Discretion for Reactor Coolant Pump (RCP) Seal Performance Findings in Triennial Fire Protection Inspections, dated November 12, 2004.