

June 14, 2010

Memorandum To: Mark A. Cunningham, Director
Division of Risk Assessment
Office of Nuclear Reactor Regulation

FROM: Alexander R. Klein, Chief **/RA/**
Fire Protection Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

SUBJECT: COMPLETION OF REVIEW OF PAST REGULATORY INSTABILITIES
RELATED TO NUCLEAR POWER PLANT FIRE PROTECTION —
ANNUAL UPDATE

The purpose of this memorandum is to provide office management with the annual update on the Fire Protection Survey. The staff closed out Task 8 of Commission Paper SECY-08-0171, "Plan for Stabilizing Fire Protection Regulatory Infrastructure in a July 1, 2009, memorandum, "Completion of Review of Past Regulatory Instabilities Related to Nuclear Power Plant Fire Protection," (Agencywide Documents Access and Management System (ADAMS), Accession Number ML091690226).

The survey identified nineteen issues with associated completion dates and responsible organizations. Enclosure 1 is a detailed status summary for the nineteen issues. Enclosure 2 provides a table summarizing the issues. Three issues have been completed, twelve are currently on path to completion and four have not yet been started. This paper provides the first annual update of issues identified by the Fire Protection Survey.

The three issues that have been completed are Issue 1 concerning electrical raceway fire barriers, Issue 12 concerning the development of an exemption database, and Issue 19 concerning the definition of "Associated Circuit".

The NRC staff plans to issue the next status summary update in June 2011.

Enclosures:
As stated

CONTACT: Stephanie Weimer, NRR/DRA
(301) 415-3381

Below is a summary of the progress of the remaining issues. Enclosure 1 contains the summary in table format.

Issue 1: Electrical Raceway Fire Barrier Systems (ERFBS)

Completed May 2010

Reference Document: NUREG 1924

Issue 2: Fire Modeling User's Guide

Internal stakeholders have identified the need for a fire modeling user's guide to help internal and external stakeholders appropriately apply fire models.

Office of Nuclear Regulatory Research (RES) developed a fire modeling user's guide draft to complement NUREG-1824, "Fire Model Verification and Validation." The user's guide provides a detailed understanding of the uses and limitations of the five fire models verified and validated in NUREG-1824. The draft was issued and the period for public comments ended April 30, 2010. RES is currently incorporating the public comments. Six documents containing the public's comments are publicly available in ADAMS.

Previous Completion Date: March 2010

Updated Completion Date: March 2011

Issue 3: Fire Probabilistic Risk Assessment (PRA) Update

Internal stakeholders have identified the need for a fire PRA update based on the lessons learned from the implementation of National Fire Protection Association (NFPA) 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants."

RES plans to issue NUREG/CR-6850, Supplement 1 by December 2010.

Previous Completion Date: August 2010

Updated Completion Date: December 2010

Issue 4: Better Understanding of Electrical Cabinet Heat Release Rate

Internal stakeholders have expressed an interest to better understand the heat release rate of fires in electrical cabinets to improve the state of knowledge for fire PRA.

RES is developing a plan for this task.

Completion Date: June 2011

Issue 5: Better Understanding of Smoke Damage to Control Circuits

Internal stakeholders have expressed an interest to better understand smoke damage to control circuits.

RES will do a literature review consolidating documentation and test reports regarding smoke damage to control circuits. After the literature review, RES will develop a testing plan to fill in gaps.

Completion Date: June 2011

Issue 6: Gaseous Fire Suppressant Agents

Internal stakeholders have expressed an interest in improving the state of knowledge on gaseous fire suppressant agents, specifically regarding their effectiveness on deep-seated fires and gas migration.

RES is preparing a NUREG-series report that will consolidate documentation regarding all known carbon dioxide and other fire suppression system gas migration occurrences and information regarding the amount of gaseous agent and hold time to extinguish deep-seated fires.

Completion Date: September 2011

Issue 7: Compensatory Measures

Internal stakeholders have expressed an interest in consolidating documentation regarding the use of compensatory measures.

RES will consolidate this information and will provide information regarding available alternative technologies for implementing fire protection compensatory measures. RES will document this information in a NUREG-series report.

Previous Completion Date: September 2010

Updated Completion Date: November 2010

Issue 8: Tracking Flame Spread Rate for Electrical Cables

Internal stakeholders identified the need for a better understanding of flame spread rates for fires in electrical cables to improve the state of knowledge for fire PRA.

RES is currently performing testing and will issue the results in a NUREG-series report.

Completion Date: June 2011

Issue 9: Update Inspection Manual Chapter 0609, Appendix F, Fire Protection Significance Determination Process

Internal stakeholders identified four issues with Inspection Manual Chapter (IMC) 0609, Appendix F, the "Fire Protection Significance Determination Process." IMC 0609, Appendix F, does not provide sufficient guidance to inspectors for evaluating:

- findings in multiple fire areas,
- risk significance for identified fire brigade issues,
- findings involving control room evacuation, and
- findings related to fire brigade performance deficiencies.

Division of Risk Assessment (DRA) staff has been assigned to evaluate these issues and is currently developing milestones to track their progress.

Previous Completion Date: December 2009

Updated Completion date: December 2011

Issue 10: Fire Induced Circuit Failures

Internal stakeholders have expressed the need to develop a process for resolving fire induced circuit failure issues.

This issue is being tracked as Task 3 in SECY 08-0171, "Plan for Stabilizing Fire Protection Regulatory Infrastructure." Steps 4 of 5 of Task 3 have been completed.

Previous Completion Date: June 2010
Updated Completion Date: December 2010

Issue 11: Operator Manual Actions

Internal stakeholders have expressed a need to have a process to identify and evaluate operator manual actions.

This issue is being tracked as Task 4 in SECY 08-0701, "Plan for Stabilizing Fire Protection Regulatory Infrastructure." Steps 3 of 5 of Task 4 have been completed.

Previous Completion Date: June 2010
Updated Completion Date: December 2010

Issue 12: Exemption Database

Completed April 2010
Reference Document: ML100200007

Issue 13: Fire Brigade Drill Participation

Internal stakeholders have expressed a need for guidance to evaluate participation requirements during fire brigade drills to address the lack of detail in current participation requirements.

NRR plans to provide guidance in its next revision of Regulatory Guide 1.189, "Fire Protection for Nuclear Power Stations," regarding this issue.

Completion Date: September 2011

Issue 14: Application of Water Based Fire Suppressants to Electrical Fires

Internal stakeholders have identified a need to outline appropriate conditions for the use of water based fire suppressants on electrical fires to address recent incidents where water was not used and the fire continued to burn.

NRR plans to update Regulatory Guide 1.189, to add guidelines for fire brigades to apply water based fire suppressants to electrical fires.

Completion Date: September 2011

Issue 15: Identifying and Managing Risk When Removing Safe Shutdown Equipment from Service for Maintenance

Internal stakeholders have expressed a need to identify and manage risk when safe shutdown equipment is removed from service for maintenance purposes.

DRA staff has been assigned to evaluate these issues and is currently developing milestones to track their progress.

Previous Completion Date: December 2009

Updated Completion Date: December 2011

Issue 16: NFPA 805, Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants

Internal stakeholders have expressed a need to develop and validate regulatory processes for NFPA 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants," transitioning plants.

NRR is in its final stage of preparing the SER for Shearon Harris Nuclear Power Plant. NRR is reviewing Oconee Nuclear Station's revised LAR.

Previous Completion Date: March 2010

Updated Dates:

Harris Completion Date: June 2010

Oconee Completion Date: December 2010

Issue 17: NFPA 805 Triennial Inspection Procedures

Internal stakeholders have expressed a need for training on inspection procedures that address new requirements for plants transitioning to NFPA 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants."

NRR is developing training modules and materials for inspection personnel related to the fire protection program in support of Inspection Manual Chapter 1245, "Qualification Program for the Office of Nuclear Reactor Regulation." RES will prepare training materials using NUREG/CR-6850 and NUREG-1824 for regional and resident inspectors who perform fire protection inspections under the Reactor Oversight Process.

Previous Completion Date: December 2010

Updated Completion Date: December 2011

Issue 18: Define "Adverse to Safe Shutdown"

Internal stakeholders have expressed an interest in having this term defined.

NRR plans to provide guidance in its next revision of Regulatory Guide 1.189, "Fire Protection for Nuclear Power Stations."

Completion Date: September 2011

Issue 19: Define "Associated Circuit"

Completed October 2009

Reference Document: RG 1.189 Revision

Status Summary Table

ISSUE	LEAD ORGANIZATION	STATUS	ESTIMATED COMPLETION DATE	
1	Electrical Raceway Fire Barrier Systems (ERFBS)	RES/DRA/FRB	Complete	May-10
2	Fire Modeling User's Guide	RES/DRA/FRB	Incorporating Public Comments	Mar-11
3	Fire Probabilistic Risk Assessment (PRA) Update	RES/DRA/FRB	NUREG/CR-6850, Supplement 1 Update in Process	Dec-10
4	Better Understanding of Electrical Cabinet Heat Release Rate	RES/DRA/FRB	In Progress	Jun-11
5	Better Understanding of Smoke Damage to Control Circuits	RES/DRA/FRB	In Progress	Jun-11
6	Gaseous Fire Suppressant Agents	RES/DRA/FRB	Not Started	Sep-11
7	Compensatory Measures	RES/DRA/FRB	Collecting Information	Nov-10
8	Tracking Flame Spread Rate for Electrical Cables	RES/DRA/FRB	Draft NUREG/Continuing Research	Jun-11
9	Update IMC 0609, Appendix F – Fire SDP	NRR/DRA/APOB	Developing Milestones	Dec-11
10	Fire Induced Circuit Failures	NRR/DRA/AFPB	Working on Validation of the Circuit Issue Disposition Method	Dec-10
11	Operator Manual Actions	NRR/DRA/AFPB	Issuing SERs	Dec-10
12	Exemption Database	NRR/DRA/AFPB	Complete	Apr-10
13	Fire Brigade Drill Participation	NRR/DRA/AFPB	Not Started	Sep-11
14	Application of Water Based Fire Suppressants to electrical fires	NRR/DRA/AFPB	Not Started	Sep-11
15	Identifying and Managing Risk When Removing Safe Shutdown Equipment from Service for Maintenance	NRR/DRA/AFPB	Developing Milestones	Dec-11

16	NFPA 805, Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants	NRR/DRA/AFPB	Harris- Preparing SER Oconee-Reviewing Revised LAR	Dec-10
17	NFPA 805 Triennial Inspection Procedures	NRR/DRA/AFPB	Developing Inspection Guidance	Dec-11
18	Define "Adverse to Safe Shutdown"	NRR/DRA/AFPB	Not Started	Sept-11
19	Define "Associated Circuit"	NRR/DRA/AFPB	Complete	Oct-09

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