

POLICY ISSUE INFORMATION

November 2, 2009

SECY-09-0161

FOR: The Commissioners

FROM: Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

SUBJECT: CLOSING FIRE PROTECTION ISSUES—SEMIANNUAL UPDATE

PURPOSE:

To provide the Commission with the semiannual update on the U.S. Nuclear Regulatory Commission (NRC) staff's plan for closing fire protection issues.

BACKGROUND:

In Staff Requirements Memorandum (SRM) M080717, "Briefing on Fire Protection Issues," dated July 29, 2008, the Commission directed the staff to provide a fire protection closure plan, including milestones and deliverables.

In response to SRM M080717, the staff prepared Commission paper SECY 08-0171, "Plan for Stabilizing Fire Protection Regulatory Infrastructure," dated November 5, 2008. That stabilization plan delineated eight tasks with associated milestones and deliverables to complete the stabilization of the regulatory infrastructure for those nuclear plants transitioning to the risk informed and performance based fire protection regulations as well as those remaining under the traditional deterministic fire protection regulations. On May 22, 2009, the staff updated the Commission on milestones that had been completed in Commission paper SECY 09-0079, "Closing Fire Protection Issues—Semiannual Update." This paper provides the second semiannual update of completed tasks in the stabilization plan.

DISCUSSION:

The NRC staff has now closed three of the eight tasks in the stabilization plan and has made substantial progress on the remaining tasks since the last update.

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The three tasks that have been completed are Task 2 concerning electrical raceway fire barriers, Task 5 concerning regulatory effectiveness assessments, and Task 8 concerning evaluation of past fire protection issues.

Below is a brief summary of the progress of the remaining tasks. The enclosure to this paper includes Revision 2 of the Plan for Stabilizing Fire Protection Regulatory Infrastructure reflecting the current status:

- Task 1: Transition to Risk Informed and Performance Based Fire Protection Requirements. Sixteen of the twenty milestones and deliverables have been completed, and the task is expected to be closed by mid calendar year 2010. The noteworthy accomplishments that have occurred since the last update of the Commission include:
 - The staff has collaborated closely with the industry to finalize a revision to the regulatory guide for 10 CFR 50.48(c) – National Fire Protection Association Standard 805 (NFPA 805) transition and the companion revision to the standard review plan. Both documents are expected to be published late this year or early next year.
 - The staff implemented more effective and timely resolution of NFPA 805 implementation challenges utilizing the frequently asked questions process.
- Task 3: Fire-Induced Circuit Failures. Fifteen of the nineteen milestones and deliverables have been completed, and the task is expected to be closed by mid calendar year 2010. One noteworthy accomplishment that has occurred since the last update of the Commission is:
 - The staff has collaborated closely with the industry to finalize a revision to Regulatory Guide 1.189, Fire Protection for Nuclear Power Plants. That guide includes guidance for analyzing and addressing fire-induced circuit failures. The guide was published in November 2009.
- Task 4: Operator Manual Actions. Six of the nine milestones and deliverables have been completed, and the task is expected to be closed by mid calendar year 2010. The staff adjusted priorities for completing the remaining interim milestones for this task based on higher priority work associated with Task 1.
- Task 6: Lessons Learned Training. One of the five milestones and deliverables has been completed, and the task is expected to be closed by mid calendar year 2010. One noteworthy accomplishment that has occurred since the last update of the Commission is:
 - The method for evaluating lessons learned has been developed and will be used in the development of lessons and training.

- Task 7: Exemption Database. One of the three milestones and deliverables has been completed, and the task is expected to be closed by early calendar year 2010. One noteworthy accomplishment that has occurred since the last update of the Commission is:
 - All fire protection exemptions have been added to the Agencywide Documents Access and Management System facilitating development of a user friendly database of exemptions.

The enclosure to this paper provides the revised stabilization plan with changes since publication of the updated plan on May 20, 2009.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections.

/RA/ (John A. Grobe for)

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Enclosure:
Plan for Stabilizing Fire Protection
Regulatory Infrastructure, Revision 2

Enclosure

PLAN FOR STABILIZING FIRE PROTECTION REGULATORY INFRASTRUCTURE

Revision 2

(Changes since May 20, 2009, are highlighted in *blue*.)

ACRONYMS

1Q	first quarter
2Q	second quarter
4Q	fourth quarter
CY	calendar year
CFR	<i>Code of Federal Regulations</i>
EGM	enforcement guidance memorandum
EPRI	Electric Power Research Institute
ERFBS	electrical raceway fire barrier system
GAO	U.S. Government Accountability Office
GL	generic letter
IN	information notice
LAR	license amendment request
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
NUREG	NRC technical report designation
NUREG/CR	NUREG contractor report
OMA	operator manual action
RG	regulatory guide
RIS	regulatory issue summary
PRA	probabilistic risk assessment
SER	safety evaluation report
SRM	staff requirements memorandum

Task 1 **Stabilize the Regulatory Infrastructure Supporting the Transition to Risk-Informed and Performance-Based Fire Protection Regulation— 10 CFR 50.48(c) and National Fire Protection Association Standard 805, “Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants, 2001 Edition” (NFPA 805)**

Objective To develop and validate the regulatory processes that facilitate the predictable, efficient, and effective transition of operating nuclear power plants to U.S. Nuclear Regulatory Commission (NRC) risk-informed and performance-based fire protection requirements.

Definition of Closure Closure is achieved when the regulatory infrastructure is in place and the NRC issues the safety evaluation reports (SERs) of the NFPA 805 pilot plants. Review and approval of subsequent license amendment requests (LARs) is considered a routine staff activity.

Background The Commission approved the final rule incorporating the 2001 revision of the national consensus standard NFPA 805 into Title 10 of the *Code of Federal Regulations* (10 CFR) 50.48(c) by reference via a staff requirements memorandum (SRM) on May 11, 2004. The rule was published on June 16, 2004, and became effective July 16, 2004. The Commission provided certain enforcement discretion as an incentive for licensees to adopt NFPA 805. Two licensees, Progress Energy and Duke Energy, volunteered the Shearon Harris Nuclear Generating Plant (Shearon Harris) and Oconee Nuclear Station (Oconee), respectively, to become pilot plants for the transition to NFPA 805.

The NRC has prepared guidance for licensees adopting NFPA 805 in Regulatory Guide (RG) 1.205, “Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants,” issued May 2006. Also, the staff endorsed the industry proposal to establish a frequently asked question program to promptly clarify issues emerging at plants in transition to NFPA 805. The staff holds monthly public meetings with the industry to discuss emerging issues.

As of today, operators of 51 reactor units have sent letters of intent indicating their commitment to transition to NFPA 805, and licensees for 50 of those units have initiated their transition.

STEPS TO CLOSURE

**DUE CALENDAR YEAR (CY)
QUARTER**

Establish Regulatory Foundation

NFPA 805 issued

Complete: January 2001

The NRC promulgates 10 CFR 50.48(c)

Complete: June 2004

Structure for Enforcement

New enforcement policy for NFPA 805 under 10 CFR 50.48, "Fire Protection," provides a 2-year enforcement discretion period	Complete: June 2004
The staff revises the NFPA 805 enforcement policy to address licensee budgetary cycles to the end of 2005 for existing noncompliances	Complete: January 2005
The staff revises the NFPA 805 enforcement policy to provide a 3-year enforcement discretion period	Complete: April 2006
The Commission approves revised enforcement discretion policy, allowing discretion to extend 6 months past the issuance of the second pilot plant's SER	Complete: September 2008

Develop Implementation Guidance

The NRC and Electric Power Research Institute (EPRI) jointly issue NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities"	Complete: September 2005
The Nuclear Energy Institute (NEI) issues industry implementation guidance NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program under 10CFR50.48(c)," Revision 1	Complete: September 2005
The staff issues RG 1.205 as guidance for plants adopting NFPA 805	Complete: May 2006
The staff issues draft Section 9.5.1.2, "Risk-Informed, Performance-Based Fire Protection Program," of Chapter 9, "Auxiliary Systems," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports," for public comment	Complete: March 2009
The staff completes the triennial procedure for pilot testing	Complete: March 2009
The staff issues draft RG 1.205 for public comment	Complete: April 2009
The staff clarifies NUREG/CR-6850 to include the current issues identified through the frequently asked questions	2009 4Q
The staff issues a revised RG 1.205 and the Standard Review Plan for NFPA 805	2009 4Q

Validate Implementation

Duke Energy sends the first letter of intent (Oconee)	Complete: February 2005
Progress Energy sends the second letter of intent (Shearon Harris)	Complete: June 2005
The NRC receives the pilot plant LAR for Shearon Harris	Complete: May 2008
The NRC reviews the pilot plant SER for Oconee	Complete: June 2008

Final Closure

The staff issues the pilot plant SER (Shearon Harris)	2010 1Q
The staff issues the pilot plant SER (Oconee)	2010 2Q

Task 2 Close Out Hemyc and MT Electrical Raceway Fire Barrier System (ERFBS) Issues for Plants Transitioning to NFPA 805

Objective To evaluate and document the actions taken to address ERFBS questions, including the specific actions taken to address issues related to Hemyc.

Definition of Closure The safety issue has been closed. This task remains open until the staff issues a report documenting the closeout of Hemyc and MT barrier issues.

Background To meet fire protection regulations, licensees often installed an ERFBS to achieve the required separation of redundant trains of cables and equipment located in the same room or fire area. The NRC found that two of these systems may be nonconforming and issued Generic Letter (GL) 2006-03, "Potentially Nonconforming Hemyc and MT Fire Barrier Configurations," dated April 10, 2006. GL 2006-03 asked licensees to describe how Hemyc, MT, and other fire barrier materials are capable of providing the appropriate fire resistance rating. By the end of CY 2007, the NRC had accepted all responses to GL 2006-03 and had approved all the licensing actions to address Hemyc issues of non-NFPA 805 plants.

On December 17, 2008, the NRC staff issued a memorandum describing the status of all plants that rely on Hemyc ERFBS. All plants have either resolved their Hemyc issues or are in transition to 10 CFR 50.48(c) and NFPA 805.

STEPS TO CLOSURE

DUE CY QUARTER

Establish Regulatory Foundation

The staff promulgates Section III.G, "Fire Protection of Safe Shutdown Capability," of Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities"

Complete: January 1980

Structure for Enforcement

No enforcement discretion for barrier issues

Not applicable

Develop Implementation Guidance

The staff issues Information Notice (IN) 2005-07, "Results of HEMYC Electrical Raceway Fire Barrier System Full Scale Fire Testing"

Complete: April 2005

The staff issues GL 2006-03

Complete: April 2006

Validate Implementation

The staff responds to all GL 2006-03 information requests

Complete: December 2007

The staff confirms closure via inspections related to GL 2006-03 (Hemyc and MT)

Complete: December 2008

Final Closure

The staff issues final closeout documentation

Complete: December 2008

Task 3 Stabilize Regulatory Infrastructure To Resolve Fire-Induced Circuit Failure Issue

Objective To implement a predictable, efficient, and effective process to ensure that licensees complete specific actions related to possible fire-induced circuit failures.

Definition of Closure Closure is achieved when the regulatory infrastructure is in place and the staff completes the validation of an application of the circuit resolution methodology. Review and approval of the subsequent use of the circuit failure resolution methodology by individual licensees is considered a routine staff activity.

Background To meet fire protection regulations, nuclear power plants must be able to demonstrate that they can be safely shut down in the event of a fire. An important requirement of these rules was the protection of redundant equipment and cables required to place the plant in a safe-shutdown state. This included a requirement to protect circuits such that plant equipment does not fail or malfunction.

Beginning in 1997, a series of licensee event reports identified plant-specific problems related to potential fire-induced electrical circuit failures that could affect equipment necessary to achieve and maintain safe shutdown. The NRC staff issued IN 99-17, "Problems Associated with Post-Fire Safe-Shutdown Circuit Analyses," on June 3, 1999, to document additional problems.

In 2001, EPRI and NEI performed a series of cable functionality fire tests to enhance the nuclear industry's understanding of fire-induced circuit failures, particularly spurious equipment actuations initiated by circuit failures. Based on the test results and continued interactions with industry, the NRC staff concluded that regulatory expectations needed to be clarified to ensure safety; to provide clear regulatory expectations in the area of fire-induced circuit failures; and where appropriate, to make plant changes to mitigate such failures.

STEPS TO CLOSURE

DUE CY QUARTER

Establish Regulatory Foundation

S. Collins (NRC) issues a letter to R. Beedle (NEI) on spurious actuations Complete: March 1997

Structure for Enforcement

The staff issues Enforcement Guidance Memorandum (EGM) 98-002, "Disposition of Violations of Appendix R, Sections III.G and III.L, Regarding Circuit Failures" Complete: March 1998

The staff issues an updated EGM, including Commission direction for fire-induced circuit failures Complete: May 2009

Develop Implementation Guidance

EPRI and NEI complete circuit failure testing at Omega Point Laboratories, Inc., Elmendorf, TX	Complete: June 2001
The staff and industry publish (through EPRI) Report No. 1006961, "Spurious Actuation of Electrical Circuits Due to Cable Fires: Results of an Expert Elicitation"	Complete: May 2002
The staff issues Regulatory Issue Summary (RIS) 2004-03, "Risk-Informed Approach for Post-Fire Safe-Shutdown Associated Circuit Inspections," Revision 1	Complete: December 2004
Industry publishes NEI 00-01, "Guidance for Post-Fire Safe-Shutdown Circuit Analysis," Revision 1	Complete: January 2005
The staff issues RIS 2005-30, "Clarification of Post-Fire Safe-Shutdown Circuit Regulatory Requirements"	Complete: December 2005
The commission issues SRM SECY-2006-0196, "Issuance of Generic Letter 2006-xx, 'Post-Fire Safe-Shutdown Circuits Analysis Spurious Actuations'"	Complete: December 2006
The staff completes additional testing for RIS 2004-03, "Risk-Informed Approach for Post-Fire Safe-Shutdown Circuit Inspections," Revision 1, dated December 29, 2004, and issues NUREG/CR-6931, "Cable Response to Live Fire (CAROLFIRE)," Volume 1, "Test Descriptions and Analysis of Circuit Response Data"; Volume 2, "Cable Fire Response Data for Fire Model Improvement"; and Volume 3, "Thermally-Induced Electrical Failure (THIEF) Model"	Complete: April 2008
The staff transmits SECY-2008-0093, "Resolution of Issues Related to Fire-Induced Circuit Failures," to the Commission for action	Complete: June 2008
The staff issues a draft of RG 1.189, "Fire Protection for Nuclear Power Plants," for comment	Complete: April 2009
The staff publishes the RIS and attached draft RG clarification of circuit expectations	<i>Determined not needed</i>
Industry revises NEI 00-01, Revision 2	<i>Complete: June 2009</i>
The NRC issues the final RG for fire-induced circuit failures	<i>2009 4Q</i>

Validate Implementation

The staff establishes a method to validate the disposition of circuit issues 2009 4Q

The staff informs the Commission of the status of circuit closure ***Complete: August 2009***

Licensees begin work to resolve circuit issues ***2009 4Q***

Final Closure

The staff completes the validation of the circuit issue disposition method 2010 2Q

Task 4 Stabilize Regulatory Infrastructure To Resolve Postfire Operator Manual Action (OMAs) Issues

Objective To ensure that licensees complete appropriate actions related to the inappropriate crediting of postfire OMAs.

Definition of Closure Closure is achieved when the regulatory infrastructure is in place and when the licensees submit LARs or exemption requests or when they complete modifications that validate the effectiveness of the infrastructure. Review and approval of those applications is considered a routine staff activity.

Background To meet fire protection regulations, licensees of nuclear power plants must demonstrate that the plant can be safely shut down in the event of a fire. An important requirement of these rules was the protection of redundant equipment and cables required to place the plant in a safe-shutdown state. In areas where redundant equipment could not be separated, the NRC permitted licensees, under certain conditions, to use postfire OMAs to mitigate the effects of the fire.

In 2000, NRC inspections found that some licensees relied on OMAs under conditions that were not permitted by the NRC to compensate for the lack of approved separation. On June 30, 2006, the NRC issued RIS 2006-10, "Regulatory Expectations with Appendix R, Paragraph III.G.2, Operator Manual Actions," dated June 30, 2006, to clarify expectations.

With the intention of giving licensees an opportunity to find and correct unapproved postfire OMAs, the NRC issued enforcement discretion for licensee-identified unapproved postfire OMAs. This discretion provided a period of time for licensees to self-identify unapproved postfire OMAs and also allowed them time to bring those unapproved postfire OMAs into compliance without the NRC's taking enforcement action. The NRC expects the unapproved postfire OMAs to be resolved through reanalysis, procedure changes, or modifications or by requesting approval from the NRC. Facilities in transition to NFPA 805 will address OMAs as part of the transition.

In October 2007, the NRC issued NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," to assist NRC staff in reviewing postfire OMA applications under conditions permitted by the NRC. NUREG-1852 is publicly available to allow licensees to examine the factors that the NRC staff will review.

The enforcement discretion for manual actions related to single spurious actuations described in Enforcement Guidance Memorandum 07-004, ended on March 6, 2009, for plants that did not have exemptions or had not submitted license amendments to the NRC for review.

STEPS TO CLOSURE

DUE CY QUARTER

Establish Regulatory Foundation

The Commission issues SRM SECY-04-0233, "Proposed Rulemaking—Post-Fire Operator Manual Actions," dated December 23, 2004

Complete: January 2005

The staff issues "Fire Protection Program—Post-Fire Operator Manual Actions," *Federal Register (FR)* notice (71 FR 11169; March 1, 2005); the proposed rule is withdrawn

Complete: March 2005

Structure for Enforcement

The staff issues enforcement discretion for OMAs as part of EGM 2007-004 for OMAs; enforcement discretion ends March 2009

Complete: June 2007

Develop Implementation Guidance

The staff publishes RIS 2006-10

Complete: June 2006

The staff publishes NUREG-1852

Complete: October 2007

Validate Implementation

Licensees complete corrective actions, LARs, or requests for exemptions

Complete: March 2009

The staff develops a plan to validate the effectiveness of the closure of OMA issues for utilities that are not transitioning to NFPA 805 and that do not have an active licensing action

2009 4Q

The staff validates the effectiveness of the infrastructure by completing a review of one licensee's resolution of the issue

2010 2Q

Final Closure

Infrastructure stabilized and validated

2010 2Q

Task 5 Assess Regulatory Effectiveness

Objective To assess the effectiveness of the ongoing improvements to the fire protection regulatory framework.

Definition of Closure Closure is achieved when a monitoring process is in place and the baseline is established. Ongoing implementation of the process is considered a routine staff activity.

Background On July 29, 2008, the Commission directed the staff in SRM M080717, "Briefing on Fire Protection Issues," to provide it with a plan to assess the effectiveness of the ongoing improvements to the fire protection regulatory framework, using recent plant data to establish a baseline. Such a baseline could be, for example, the number and general types of all open fire protection deficiencies that were compensated and the manner of compensation used in 2007.

The U.S. Government Accountability Office (GAO), in GAO 08-747, "Nuclear Safety: NRC's Oversight of Fire Protection at U.S. Commercial Nuclear Reactor Units Could Be Strengthened," issued June 2008, included a recommendation to "develop a central database for tracking the status of exemptions, compensatory measures, and manual actions in place nationwide and at individual commercial nuclear units."

The NRC Chairman responded to GAO 08-747 in a letter to Congress dated September 11, 2008. The letter committed to "implement a Fire Protection Closure Plan to resolve the issues contributing to the long-term use of compensatory measures. The Commission has directed the staff to include meaningful metrics to gauge progress in implementation of the Closure Plan." This action will resolve the issues of long-term compensatory measures and unapproved manual actions that have associated compensatory measures.

STEPS TO CLOSURE

DUE CY QUARTER

Commission Commitments

The staff determines the metric for measuring the effectiveness of ongoing improvements

Complete: December 2008

The staff develops a metric monitoring methodology

Complete: March 2009

Final Closure

The staff collects information and establishes monitoring

Complete: November 2009

Task 6 Develop Training on Historical Lessons Learned from Fire Protection

Objective To train appropriate staff on the important historical lessons learned from the fire protection issue resolution activities since the establishment of Appendix R to 10 CFR Part 50.

Definition of Closure Closure is achieved when a lessons-learned review is completed, lessons are incorporated into a knowledge management or training program, and the adequacy of that program is validated using a pilot application. Ongoing staff awareness and training are considered part of routine staff activity.

Background On July 29, 2008, the Commission directed the staff in SRM M080717 to provide it with a closure plan that includes training for appropriate staff on the important historical lessons learned from the fire protection issue resolution activities since the establishment of Appendix R to 10 CFR Part 50.

STEPS TO CLOSURE

DUE CY QUARTER

Perform Lessons Learned Evaluation

The staff compiles history

Complete: March 2009

The staff develops lessons learned

2009 4Q

Develop Knowledge Management/Training Tool

The staff develops training on lessons learned

2010 1Q

The staff conducts pilot training on fire protection lessons learned

2010 1Q

Final Closure

The staff incorporates lessons learned from pilot training

2010 2Q

Task 7 Develop an Exemption Database

Objective To develop a centralized database of fire protection exemptions for operating nuclear reactors.

Definition of Closure Closure is achieved when the exemption database is established and procedures and plans are in place for the periodic updating of that database. Periodic updates to the database are considered a routine staff activity.

Background GAO 08-747 included a recommendation to “develop a central database for tracking the status of exemptions.”

The NRC Chairman responded to GAO 08-747 in a letter to Congress dated September 11, 2008, which contained a commitment to “develop a centralized database of fire protection exemptions for operating nuclear reactors.”

STEPS TO CLOSURE

DUE CY QUARTER

Commission Commitments

The staff collects data on fire protection exemptions	<i>Complete: June 2009</i>
The staff completes development of the database	2009 4Q

Final Closure

The staff establishes procedures for updates	2010 1Q
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Task 8 Establish Reasonable Assurance that All Past Regulatory Infrastructure Instabilities Are Identified

Objective To identify any additional fire protection issues that require further action.

Definition of Closure Closure is achieved when the review is complete and appropriate actions are taken to address any fire protection regulatory issues identified. Addressing any additional issues identified is considered a routine staff activity.

Background Since the publication of the fire protection rule in 1981, the NRC has identified and addressed many issues by using regulatory practices that were deemed appropriate at the time these issues were identified.

The NRC staff has initiated an effort to identify any outstanding fire protection issues by surveying cognizant NRC staff concerning the regulatory history of fire protection. The identification of additional issues will give the staff a more complete understanding of the issues and confidence that the agency is addressing all the necessary issues. The staff's activities for this effort include methodically surveying past and present NRC staff with knowledge of fire protection issues, evaluating their responses, and recommending followup actions.

STEPS TO CLOSURE

DUE CY QUARTER

Commission Commitments

The staff completes review

Complete: April 2009

The staff evaluates responses

Complete: July 2009

Final Closure

The staff identifies issues and develops recommendations

Complete: July 2009