



NRR FIRE PROTECTION IMPROVEMENT PLAN

Background

The Nuclear Regulatory Commission (NRC) has been applying its four outcome goals to the management of its fire protection program: Maintain safety, reduce unnecessary regulatory burden, increase public confidence, and improve efficiency and effectiveness, and has been making significant progress. The challenges 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. In addition, activities to employ risk-informed thinking in the area of fire protection are in development with technical issues, such as fire modeling, as challenges.

The Office of Nuclear Reactor Regulation Fire Protection Improvement Program (NRR FPIP) continues to receive considerable feedback from a number of stakeholders. These include concerns with:

- The progress in resolving circuit analysis issues (Attachment 1)
- Circuit analysis inspection activity (Attachment 1)
- The uniformity in our approach when manual actions are employed to meet 10 CFR Part 50, Appendix R III.G.2 (Attachment 2, Item 1)
- Inspections taking into account the Current Licensing Basis (CLB) at the facility being inspected or give credit for self assessments (Attachment 2, Item 2)
- The treatment of old design issues in the fire protection area and issue management in general (Attachment 2, Item 3)
- The application of Significance Determination Process (SDP) in the fire protection area (Attachment 2, Item 4)
- Relying on fire watches as compensatory measures (Attachment 2, Item 5)
- The application of "Quantitative Fire Hazard Analysis Methods" in the inspection program (Attachment 2, Item 6)
- The NRC position on fire protection equipment included in the scope of License Renewal Application (LRA) reviews (Attachment 2, Item 7)
- A need for adequate guidance for advanced reactors in the fire protection area (Attachment 2, Item 8)
- Risk-informed rulemaking (NFPA 805) (Attachment 2, Item 10)
- Fire protection program pilot for combined operating license (Attachment 2, Item 11)
- Testing of selected fire barrier materials (Attachment 2, Item 12)

All of these concerns pointed to the need for a comprehensive Fire Protection Improvement Plan (FPIP) to manage staff efforts to improve the fire protection regulatory environment (Attachment 2, Item 9). The FPIP is managed by the NRR's Division of Systems Safety and Analysis (DSSA).

Improvement Plan Objectives

Much progress has been made in a number of fire protection areas, including the issuance of a comprehensive Regulatory Guide (RG), a proposed risk-informed and performance-based rule (Attachment 2, Item 10), issuance of a RIS on risk-informed associated circuit analysis, issuance of NUREG-1805 (for comment) on fire modeling and substantial improvements in inspector training. Emerging challenges facing the fire protection program (FPP) reinforce the need for a clear and comprehensive fire protection improvement plan (FPIP). This NRR FPIP started in October 2002.

The FPIP was developed to consider and take appropriate actions in response to concerns and feedback from stakeholders regarding implementation of the FPP. The FPIP is formulated as a separate document comprising a list of fire protection improvement activities with milestones and schedules identified. The first element of the FPIP is a proposed inspection and resolution plan for the longstanding circuit analysis issue. The Circuit Analysis Resolution Plan (CARP) was updated in October 2002. The FPIP also describes other topics of the improvement plan that are in place or will be developed as resources permit.

The FPIP combines the CARP, fire protection SDP Improvement Program with our rulemaking plans (NFPA 805 Standard), resolution of the issue of using manual action to meet 10 CFR 50, Appendix R, Section III.G.2, guidance development, and training initiatives to produce a comprehensive plan. In order to effectively manage the fire protection program consistent with other agency programs, it will also be necessary to get old design issues into a satisfactory resolution process. Experience has shown that the Task Interface Agreement (TIA) process has not served us well when evaluating performance issues where the licensing basis was not clear, or when evaluating old design issues. The TIA process has been augmented with decision logic that would enable more efficient application of limited resources for emerging fire protection issues that are identified in the Reactor Oversight Process (ROP) to determine if they represent actual performance deficiencies, preferably before they have triggered an inspection finding and a formal risk significance determination (Attachment 2, Item 3).

A pilot effort to resolve potential generic issues associated with gaseous suppression systems identified in the ROP has been completed. The pilot effort employed augmented decision logic to require a prompt decision on the applicability of the CLB, then move those issues which are not subject to enforcement into a backfit process, rulemaking process, or generic issue process, taking risk implications into consideration. The decision logic provided for the issues to be prioritized so that resource application determinations could be made. In December 2002, the Plant Systems Branch (SPLB) staff provided training to the Division of Licensing and Project Management (DLPM) on using the augmented decision logic. The results of this pilot effort could be shared with the program office to be evaluated for acceptability as an approach for old design issues across the board, not just for fire protection issues. Other issues such as circuit analysis risk uncertain configurations have been transferred to the NRC Office of Nuclear Regulatory Research (RES) for consideration in the Fire Risk Research Plan: Fiscal Years 2003–2006.

The FPIP has four attachments. The first covers the proposed CARP. The second deals with other fire protection topics that have been identified by stake holders. The third lists public meetings that have been held to resolve major fire protection issues. The fourth identifies fire protection emerging issues. These attachments will be revised as necessary to update progress and identify new issues.

**Fire Protection Improvement Plan
Proposed Circuit Analysis and Resolution Plan (CARP)
Attachment 1**

Part 1 - Circuit Analysis Inspection Plan

Below items support the withdrawal of the circuit analysis Enforcement Guidance Memorandum

Activity	Schedule/Status
Obtain stakeholder perspectives from the Facilitated Workshop.	February 2003 (Complete)
Meet with NEI on the draft inspection plan	March 2003 (Complete)
Draft Regulatory Information Summary (RIS) on associated circuits and transmit to Reactor Improvements Branch (RORP)	May 2003 (Complete)
Issue the RIS and input to inspection guidance for public comment	August 2003 (Complete)
Receive IIPB and OE agreement on enforcement policy on old open items and on new findings	August 2003 (ML 032030584) (Complete)
Draft NUREG for public comments	October 2003
Issue the final RIS on associated circuits	October 2003
Begin training NRC staff on the inspection guidance	September 2003
Conduct public workshop on new risk-informed associated circuit inspection	October 2003
Withdraw circuit analysis EGM	October 2003

Part 2 - Circuit Analysis Resolution Plan (CARP)

Below items support the resolution of the CARP and new risk-informed RG

Activity	Schedule/Status
Develop and Obtain Management Approval of CARP	September - October 2002 (Complete)
Complete SECY on "fixes" to circuit issues via manual actions	February 2004
Complete SECY on enforcement policy on old open items and on new findings	February 2004
Endorse the final industry guidance in a new risk-informed RG on NFPA 805	December 2004

**Fire Protection Improvement Plan
Other Topics
Attachment 2**

Item 1 - Manual Actions

Activity	Schedule/Status
Draft Regulatory Information Summary (RIS) and forward it to RORP	February 2003 (Complete)
Document the appropriateness of symptom-based fire protection procedures	March 2003 (Complete)
Prepare a proposed Rulemaking Plan	March 2003 (Complete)
Prepare an Interim Enforcement Policy Statement to support rulemaking	December 2003
Revise RG 1.189 to include manual actions	TBD

Item 2 - Licensing Basis

Activity	Schedule/Status
Consider a risk-informed approach to establish licensing basis issue priorities	April 2003 (Complete)
Engage NEI on potential incentives to promote adoption of NFPA 805 (e.g., credit for self-assessments)	August 2003 (Complete)
Response to NEI on potential incentives to promote adoption of NFPA 805	August 2003
SECY to receive Commission approval for some incentives to the licensees (e.g., credit for self assessment)	February 2004

Item 3 - Old Design Issues

Activity	Schedule/Status
Collect emerging issues being developed in ROP	Continuous (See Attachment 4)
Enhance management controls on the inspector and technical staff interface	November 2002 (Complete)
Train DLPM on the pilot TIA process with NRC stakeholders	December 2002 (Complete)
Establish periodic meeting schedule with NEI to discuss and prioritize emerging issues	January 2003 (Complete)

Activity	Schedule/Status
Consider a risk-informed approach as a threshold to identify emerging issues	February 2003 (Complete-Issues prioritized in Protocol)
Train regions on the pilot TIA process	January 2004

Item 4 - Application of SDP

Activity	Schedule/Status
Support SDP improvement program	As needed
Update fire frequency data base	October 2002 (Complete)
Obtain PRA training for selected fire protection engineers	April 2003 (Complete)
Conduct table top exercises on draft fire protection SDP	October 2003
Conduct training on revised fire protection SDP	December 2003
Issue revised fire protection SDP guidance	April 2004
Develop fire brigade SDP for ROP use	May 2004

Item 5 - Use of Compensatory Measures (Predecisional)

Activity	Schedule/Status
Determine the appropriateness of fire watches being used for non-safety compliance issues and prepare white paper	August 2003

Item 6 - Quantitative Fire Hazards Evaluation

Activity	Schedule/Status
Develop quantitative fire hazards analysis tools	Ongoing (Complete)
Issue Draft NUREG-1805 and spreadsheets for public comments	June 2003 (Complete)
Issue Final NUREG-1805	November 2003

Item 7 - LRA Scoping Fire Protection Equipment

Activity	Schedule/Status
Publish License Renewal Application (LRA) review criteria for scoping fire protection as an ISG	November 2002 (Complete)
Refer transferred ISG license renewal issues to RLEP	January 2003 (Complete)

Item 8 - Advanced Reactors

Activity	Schedule/Status
Revise Standard Review Plan (SRP) Section 9.5.1 Concurrence cycle	July 2003 (Complete)
Revise Standard Review Plan (SRP) Section 9.5.1 Final issuance	December 2003

Item 9 - FPIP Development

Activity	Schedule/Status
Complete the FPIP and obtain management concurrence	November 2002 (Complete)
Meet with stakeholders to discuss FPIP in workshop	November 2002 (Complete)

Item 10 - Risk Informed Rule

Activity	Schedule/Status
Review and comment on NEI implementation guidance for NFPA 805 rulemaking	November 2002 (Complete)
Support NFPA 805 rulemaking	DSSA as needed
Issue proposed rule for public comment	November 2002 (DRIP Lead) (Complete)
75 day comment period on proposed rule ends	January 2003 (DRIP Lead) (Complete)
NEI Implementation Guidance pilot table top exercise at Farley on the change control process	April 2003 (Complete)
Receive revision D of NEI Implementation Guidance for NFPA 805 rulemaking	May 2003 (Complete)
NEI Implementation Guidance table top exercise at McGuire on transition	August 2003 (Complete)
All comments on proposed rule resolved with OGC assistance	September 2003 (DRIP Lead)
DRIP issues draft final rule package for internal NRR review and ADM review	September 2003 (DRIP Lead)
DRIP issues final rule package for inter-office concurrence	October 2003 (DRIP Lead)
ACRS and CRGR briefings	November 2003 (DRIP Lead)
NRR OD concurrence obtained	November 2003 (DRIP Lead)

Activity	Schedule/Status
Prepare draft RG for public comment to support the rule	June 2004
Establish enforcement policy during transition period	TBD
SRM issued after Commission vote	TBD (DRIP Lead)
Final Rule published in Federal Register	TBD (DRIP Lead)

Item 11 - Fire Protection as a Pilot for Programmatic Inspection, Tests, Analyses, and Acceptance Criteria (ITAAC)

Activity	Schedule/Status
Workshop to discuss with interested stakeholders ITAAC for operational programs	August 2003 (DRIP Lead)

Item 12 - RES Fire Barrier testing

Activity	Schedule/Status
Complete fire barrier test plan (Hemyc and MT) and transfer to RES	January 2003 (Complete)

**Fire Protection Improvement Plan
Public Meetings in Fire Protection Major Program Areas 1998-Present
Attachment 3**

Subject Area	Date	Purpose/Comments
Circuit Analysis	July 1, 1998	Presentation to ACRS on post-fire safe shutdown circuit analysis
	July 23, 1998	NRC workshop for Public and Industry on post-fire safe shutdown circuit analysis (National attendance by public and industry)
	December 14, 1998	Meeting with NEI in fire-induced circuit failure assumptions for various cable configurations
	March 25, 1999	NRC staff/NEI meeting to discuss fire-induced circuit failures
	May 3/5, 1999	NEI Fire Protection Forum, Public Meeting. NRC discusses issue resolution and status. NEI discusses industry activity. RES presents their research on issue. Cleveland, Ohio
	August 18–19, 1999	Meeting with BWROG to discuss circuit analysis issues.
	October 18–20, 1999	NEI Fire Protection Forum, Public Meeting. NRC discusses Resolution status NEI presented Assessment Methodology, St. Peterburg, Florida
	December 20, 1999	Meeting to discuss status of the NEI post-fire safe shutdown circuit analysis methodology development efforts (NEI 00-01)
	April 13, 2000	NRC staff/NEI meeting to discuss NEI 00-01, Rev. A
	May 25, 2000	Tele-conference with NEI to discuss preliminary staff comment on NEI 00-01 Rev. A
	July 21, 2000	Meeting with NEI to discuss Sandia Report, "Circuit Analysis, Failure Modes and Likelihood Analysis," and relates circuit analysis technical issues
	July 26, 2000	NRC staff/BWROG/NEI on post-fire safe shutdown circuit analysis

Subject Area	Date	Purpose/Comments
	October 3, 2000	NRC staff/NEI meeting on (Circuit Analysis) fire test protocols
	February 4–7, 2001	NRC staff presentation on fire-induced circuit failure analysis, NEI Fire Protection Information Forum (General Industry in attendance). Also, NEI status presentation on NEI 00-01
	August 8, 2001	NRC staff/NEI meeting to discuss industry progress on circuit analysis resolution activities
	October 22–25, 2001	NEI Fire Protection Information Forum, NRC presents status of fire-protection issues. Public Meeting, Clearwater, Florida
	June 4, 2002	NEI and NRR staff present their view of draft NEI 00-01, Rev. C to ACRS Fire Protection Subcommittee (Public Meeting at HQs)
	August 29–30, 2002	NEI Fire Protection Information Forum. NEI presents the results of pilot use of NEI 00-01 NRC staff present comments on the NEI 00-01 and NRC resolution plan
	October 22, 2002	NEI explained the NEI 00-01, Rev. D to the staff (Public Meeting at HQs)
	February 19, 2003	The NRC hosted an all-day Facilitated Workshop to discuss risk-informing the associated circuit inspection portion of the fire protection triennial inspections. The meeting was facilitated by an OGC representative. The Workshop was attended by representatives from licensees, industry groups (NEI, EPRI), consulting firms, national laboratories (SNL, BNL), RES, Region I and NRR
	March 20, 2003	Presentation of the, "Proposed Risk Informed Inspection Guidance for Post-fire Safe-Shutdown Associated Circuit Inspection," at regularly scheduled IIPB/NEI meeting
	September 9, 2003	Presentation to ACRS fire protection subcommittee
	October 15–16, 2003	Risk-informed associated circuits inspection public workshop

Subject Area	Date	Purpose/Comments
NFPA 805 Rulemaking	January 16, 2002	Continue discussion of the NEI implementing guidance for NFPA 805
	February 12, 2002	Continue discussion of the NEI implementing guidance NFPA 805
	February 26, 2002	Continue discussion of NEI implementing guidance for NFPA 805
	April 23, 2002	Continue discussions of issues raised in the NEI letter of April 9, 2002 concerning fire protection rulemaking language to adopt NFPA 805
	August 1, 2002	Continue the discussion of NEI implementing guidance for NFPA 805
Manual Actions	June 20, 2002	Follow-up discussion of May 16, 2002-letter on the use of manual actions to achieve a safe shutdown, to satisfy the requirement of Section III.G.2 of Appendix R to 10CFR50
	August 21, 2002	SPLB met with Executive Team (ET) and received direction to proceed with rulemaking
	August 29, 2002	SPLB presented description of, "Feasible Manual Actions," to public at NEI Fire Protection Information Forum in Seattle, Washington
	November 6, 2002	SPLB presented description of "feasible manual actions," to public at Licensing Workshop at Washington Terrace Hotel, DC
Fire Protection SDP	May 23, 2002	Public meeting to discuss fire protection SDP revision
	July 9, 2002	Public meeting to discuss fire protection SDP revision
	August 14, 2002	Working Group meeting to discuss Phase 2 fire protection SDP methodology
	September 4, 2002	The NRC staff and NEI discussed separate Phase 1 screening alternatives. Eleven issues for improving Phase 2 were discussed and task leaders were assigned action plans for short and long term fixes to be presented at a workshop in November

Subject Area	Date	Purpose/Comments
	September 14, 2002	An update of all overall SDP revision effort was presented at the Fire Protection Inspector Workshop in Region III. Three issues (i.e., fire scenario development, and fire barriers) were discussed with inspectors to mine resolution alternatives
	November 2002	Public workshop to discuss new fire protection SDP methodology
	April 14, 2003	Public workshop to discuss draft fire protection SDP methodology
Fire Protection Improvement Plan (FPIP)	November 5, 2002	The SPLB Branch Chief briefs NRR Associate Director on the FPIP
	November 6, 2002	The FPIP is presented at the NEI licensing forum at the Washington Terrace
	November 20, 2002	The NRR Office Director is briefed on the FPIP by the SPLB Branch Chief
	January 15, 2003	NRC staff and NEI representatives held a public meeting to discuss FPIP updates and the management of emerging issues
	March 18, 2003	NRC staff and NEI representatives held a public meeting to continue the discussion on FP emerging issues
	April 18, 2003	NRC staff and NEI representatives held a public meeting to continue the discussion on fire protection issue management

**Fire Protection Improvement Plan
Fire Protection Emerging Issues
Attachment 4**

Emerging Issue	Status
Incentives for adopting NFPA 805 (ADAMS ML030370027)	Staff/NEI March 2003 agenda item
Interim inspection guidance for manual actions (ADAMS ML030370027)	Staff/NEI March 2003 agenda item
Scoping for license renewal is a CLB issue under Part 50. Reference item 7, Attachment 2 (ADAMS ML030370027)	Staff/NEI April 2003 agenda item
Seek Region feedback on NEI concerns with inspectors in the areas of safe- shutdowns and the regulatory process. (ADAMS ML030370027)	Staff/NEI March 2003 agenda item
Clarify the process and documentation necessary to provide fire-protection issue closure (ADAMS ML030370027)	Staff/NEI April 2003 agenda item
Heat collector sprinkler heads (ADAMS ML023030065)	SPLB representatives attended a public meeting at the Brunswick site in February 2003
Evaluate results of first round of triennial inspections (ADAMS ML030370027)	Staff/NEI April 2003 agenda item
Epoxy floor coating flame spread	Staff/NEI August 2003 agenda item
Alternate shutdown timing issues	Staff/NEI August 2003 agenda item
Fire protection safety evaluations in CLB	Action item identified at National Regional Utility Group (RUG) meeting 2003. Staff/NEI August 2003 meeting agenda item
NRC fire protection regional public workshops	Action item identified at National Regional Utility Group (RUG) meeting 2003. Staff/NEI August 2003 meeting agenda item
Fort Calhoun CLB	Action item identified at National Regional Utility Group (RUG) meeting 2003. Staff/NEI August 2003 meeting agenda item
Gaseous fire suppression system lockouts	Staff/NEI August 2003 agenda item