NFPA 805 TRANSITION PILOT PROGRAM OBSERVATION VISIT TRIP REPORT

Date: November 7-10, 2005

Location: Duke Energy Headquarters, Charlotte, North Carolina

Attendees: The meeting was attended by representatives of the following organizations:

Duke Power	NRC Headquarters
Progress Energy	NRC Region II
Entergy	Pacific Northwest National Laboratory
South Carolina Electric and Gas	ERIN Engineering and Research Inc.
Kleinsorg Group	

Subject: Risk-Informed, Performance-Based Fire Protection Transition Pilot-Plant Observation Visit - Oconee Nuclear Station and Harris Nuclear Plant

Agenda: See Attachment 1

Summary:

The first two Nuclear Regulatory Commission (NRC) transition pilot plant observation visits for implementation of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.48(c) were held concurrently with representatives from Duke Power and Progress Energy at Duke headquarters in Charlotte, North Carolina. Other utility and industry representatives were also present to observe the proceedings. Duke Power and Progress Energy presented the current status for their respective transition projects and specific topics related to 10 CFR 50.48(c) implementation. These topics included: (1) a proposed approach to evaluating multiple spurious operations; (2) an example National Fire Protection Association (NFPA) 805 change process; (3) discussion of fire probabilistic risk assessment (PRA) peer reviews; (4) the NFPA 805 Chapter 4 methodology; and (5) risk impact reviews of fire protection program deficiencies (existing or identified during transition). Specific issues identified during the observation meeting were compiled in a "parking lot" list and assigned to various participants for resolution (Attachment 2). These issues involved needs for clarification to the implementing guidance documents as well as regulatory and licensing issues requiring further evaluation by the staff or licensees to determine possible resolutions to be discussed at future meetings.

General Discussion:

This trip combined the initial NRC observation visits for on-going pilot-plant activities by Duke Power and Progress Energy involving the transition from their current fire protection programs to a risk-informed, performance-based fire protection program that meets 10 CFR 50.48(c) and NFPA 805, as endorsed therein.

ENCLOSURE

The general objective of the observation visits was to facilitate communications between NRC staff and the pilot plant licensees adopting 10 CFR 50.48(c) in order to: (1) gain experience with plant specific application of risk-informed, performance-based methods, including validation of the approach and methods of Nuclear Energy Institute (NEI) NEI 04-02, and draft regulatory guide, DG-1139; (2) identify regulatory and licensing issues that may impact implementation; and (3) identify improvements and lessons learned to be considered in future revisions and applications of the implementing guidance, methods, and future inspection procedures and inspector training.

Duke Power's Oconee Nuclear Station (ONS), and Progress Energy's Harris Nuclear Plant (HNP) are the (currently) designated pilot plants for 10 CFR 50.48(c) implementation. Both utilities had representatives at the meeting to present their respective transition project status and to present information on specific topics as identified in the attached agenda. The topics covered are works-in-progress and do not represent final analyses, processes, or procedures. The presentations are included as Attachments 3 through 12 to this report.

The observation meeting presentations and related discussions identified several issues and needs that are documented on the attached "parking lot" list that was developed over the course of the 4-day meeting. Some of the identified issues involve clarifications to current guidance and will be incorporated in the next revision of NEI 04-02. Others will require further evaluation on the part of the industry and/or NRC staff to identify possible resolutions to be discussed at the next meeting or in future revisions to NEI 04-02 or the regulatory guide.

The presentations, interactions, and discussions resulting from this first meeting were valuable in identifying important issues that need to be addressed as the transition efforts continue. It is recommended that these meetings be continued on a quarterly basis, concurrent, to the extent feasible, with both licensees. The need to increase (or decrease) the frequency of future observation visits should be re-evaluated following each visit and be based on the pilot plant project status, on-going activities, and specific issues that indicate a need for greater (or lesser) NRC involvement.

Specific Meeting Topics:

The following fire protection program transition topics were discussed during the course of the 4-day meeting. Issues associated with these topics are identified by number corresponding to the issue number in Attachment 2:

Multiple Spurious Component Operation: Duke Power presented their proposed concept for evaluating both single and risk-significant multiple spurious component operations (See Attachment 6). The component and scenario selection will be based on three independent inputs (i.e., the Appendix R reconstitution results, the plant PRA model, and expert panel elicitation) followed by a peer review. The impracticality of analyzing all potential multiple spurious combinations was discussed at length. The proposed approach will use risk screening methods to reduce the scope of analysis. New multiple spurious operations that are identified will not be

included in the license basis until risk screening is complete and only if they are identified as potentially risk significant (i.e., core damage frequency (CDF) is greater than 1E-06/year; large early release frequency is greater than 1E-07/year). A "gray area" was defined for those multiple spurious combinations that do not meet the "potentially risk significant" criteria, but have an estimated CDF greater than 1E-08/year and LERF greater than 1E-09/yr. These combinations will be dispositioned via modification or procedure changes if practical to do so. Considerable discussion was held regarding the screening process, the treatment of multiple spurious operations outside the license basis (until risk significance is determined), and the treatment of components in the "gray area." The NRC staff will review the proposed approach to evaluating spurious operation and provide feedback during a future public meeting(s) on the draft regulatory guide, DG-1139. Issues associated with this topic are Items 1 and 2 in Attachment 2.

Appendix R Reconstitution: Duke Power presented the status of the Appendix R reconstitution effort (See Attachment 5). This effort will provide a deterministic baseline for transition and input to the fire PRA and the evaluations of multiple spurious operations. The Duke Power and other industry representatives expressed concerns that the draft Regulatory Issue Summary (RIS) and generic letter (GL) addressing post-fire safe shutdown circuit analysis could have a significant impact on this effort. Specifically, compliance with the provisions of the RIS and GL could not be achieved. This issue could impact implementation of NFPA 805 because it will limit the ability to directly transition existing safe-shutdown analyses (without considerable new analysis efforts) and complicates the risk analysis requirements of NFPA 805, Chapter 4 that require comparison to the deterministic basis. Issues related to this topic are Items 3 and 17 in Attachment 2.

NFPA 805 Chapter 4 Transition: Duke Power gave a brief presentation and example on the approach to transitioning the nuclear safety capability (See Attachment 7). Considerable discussion was held on the sub-topic of high-low interface components. Duke commented that NEI 00-01 (and RIS 2004-03, Rev. 1) are not consistent with the Oconee list of high-low pressure interface components using the NFPA 805 definition for high-low pressure interface. Duke Power's proposed approach is to transition the high-low interface components identified for Oconee (i.e., only the decay heat removal valves) on the basis that the new circuit analysis is being performed according to NEI 00-01 and will be submitted for approval as a new circuit analysis license basis. The NRC staff commented that regardless of the inconsistencies in the guidance, NFPA 805 establishes the requirements that must be met. The need for clarification of the treatment of high-low interfaces is documented as Item 4 in Attachment 2.

Change Evaluation Process: Progress Energy presented their draft procedure and examples for performing (post-transition) change evaluations (See Attachment 10). Considerable discussion was held relative to integrating change evaluation results with the PRA and having licensee PRA staff more involved in the change process. Review of the examples identified a number of issues including the relationship between certain NFPA 805 Chapter 3 and Chapter 4 requirements and the discussion of using risk-informed, performance-based methods for Chapter 3 requirements. This discussion centers on requirements for suppression, detection, and fire barriers that are dependent on the analyses of Chapter 4. The change evaluation process needs to evaluate

Chapter 4 impacts prior to the associated elements of Chapter 3. Additional discussions were held relative to establishing the necessary change evaluation baseline during and after transition, including the need to carry forth or trend transition changes to CDF, post-transition. Lastly, the subject of authority having jurisdiction (AHJ) relative to the change process was discussed for changes involving NFPA code compliance deficiencies, code associated design review and approval requirements, and other code related requirements specifically tied to AHJ approval authority. The practicality of the NRC fulfilling the role of AHJ for all code related issues was discussed. Issues identified as part of this presentation include Items 7-15 in Attachment 2.

Aggregate Review of Deficiencies: Progress Energy presented an approach to treating existing fire protection program deficiencies during the transition period (See Attachment 9). A conference call was held with NRC headquarters fire protection staff to discuss the approach. No specific issues were identified.

PRA Peer Review: Progress Energy presented a proposed approach to peer review for fire PRA (See Attachment 8). The approach will use peer review as major steps are completed instead of waiting until the project end. Issues associated with peer review are described in Item 5 of Attachment 2. The primary concern is lack of approved peer review guidance and the level of effort to perform the review relative to the overall NFPA 805 implementation schedule.

Specific Issues Assigned to NRC:

A number of issues were identified over the course of the meeting and documented in Attachment 2. Many of these issues were assigned to industry representatives for resolution primarily through clarifications and updates to NEI 04-02. The changes to NEI 04-02 will be reviewed by the staff in support of the endorsement of NEI 04-02 in draft regulatory guide, DG-1139. The issues listed in the attachment and assigned to the NRC for further evaluation are as follows:

Item 1: The proposed industry approach to evaluating multiple spurious operations is described in NEI 04-02, Appendix B-2, which, in turn, referenced NEI 00-01. The proposed approach is to analyze all single spurious operations and risk-significant multiple spurious operations. New multiple spurious operations that are identified through review processes will not be considered part of the licensing basis unless determined to be risk significant. The issue requiring further evaluation is how this approach to initially excluding new multiple spurious from the license basis (until risk significance is determined) will be treated under the reactor oversight process (ROP).

Item 5: The fire PRA effort for Oconee is critical path and the current schedule for completion of the PRA and submittal of the license amendment for adopting 10 CFR 50.48(c) and NFPA 805 will not support completion of the PRA peer review prior to submittal. Peer review methods and guidance development is ongoing (e.g., draft American Nuclear Society (ANS) Fire PRA Standard, BSR/ANS 58.23, and revisions to the NEI peer review process, NEI 00-02). The

fire PRA peer review process is estimated to take three to four months to complete and, therefore, can have a significant impact on the schedule if completion is required prior to license amendment submittal. Discussion of this issue indicated that NRC oversight of the pilot effort might provide some confidence in the PRA as part of the transition program but non-pilot plants could be significantly impacted by the peer review schedule since these plants would be beyond the pilot process and subject to the need for a peer review. The NRC staff was asked to evaluate the peer review process and requirements relative to transition schedules and license amendment submittal with clarification added to the draft regulatory guide, DG-1139, as appropriate.

Item 6: The industry representatives indicated that any requirement for a shutdown modes PRA would be a "show stopper." There is no current or planned guidance/methods for performing a shutdown PRA. Resources are not likely to be committed by utility management, and the development of methods and performance of the PRA would not support the transition schedules. Implementing guidance for meeting 10 CFR 50.48(c) should be clarified to explicitly indicate the expectations for assessing fire risk in shutdown modes.

Item 14: The NRC is the defacto AHJ for the purpose of determining acceptability of fire protection program elements to meet the requirements of NFPA 805 (where AHJ authority is cited in the NFPA 805 Standard). Chapter 3 of NFPA 805 references other NFPA codes that apply to administrative and design elements of the fire protection program (e.g., those that apply to suppression, detection, and water supply) that are managed day-to-day by the licensee but also contain responsibilities and requirements for AHJ approval. A compliance approach that applies the AHJ authority (as described in the NFPA Standards) as strictly meaning NRC approval could burden the NRC with reviewing fire protection system design changes and administrative procedures that implement NFPA code provisions requiring AHJ approval. Minor deviations to code compliance would also require possible NRC review. Licensees would be burdened by costs and delays associated with the review and approval process.

NFPA 805, Section 3.2.2.4, requires the licensee's fire protection policy to identify the appropriate AHJ for the various areas of the fire protection program. Consideration should be given to clarifying the role of NRC as AHJ (e.g., in the draft regulatory guide, DG-1139) relative to implementing the NFPA codes in a manner that is practical for both the NRC and licensee while maintaining the NRC's role in assuring public safety.

Item 15: Discussion was held regarding the tracking of the cumulative impact of changes to the fire protection program that occur during the transition process. These impacts are incorporated in the new baseline risk established at the completion of implementation. Clarification is needed in the implementing guidance (i.e., regulatory guide or NEI 04-02) as to whether the tracking of these impacts needs to be continued post-transition or whether tracking of cumulative impacts begins when the new baseline risk is established.

Item 16: As indicated by the "parking lot" list of issues, a number of changes may be necessary to the implementing guidance in NEI 04-02 or the draft regulatory guide. It is expected that the need to make these types of changes will continue to be identified in future observation meetings. The processes for revising and reissuing these documents is not efficient nor timely enough to support the on-going transition activities. Administrative mechanisms are necessary to allow guidance changes to be accumulated (e.g., as errata) between official/approved revisions. The ability to apply interim changes to the guidance is potentially problematic because of the regulatory guide revision and approval process and the direct endorsement of a specific revision of NEI 04-02 within the regulatory guide.

Item 17: Although not specifically assigned to the NRC for evaluation, this issue has significant implications related to implementation of NFPA 805. Specifically, the circuit analysis RIS and draft GL require a level of compliance for deterministic circuit analysis (associated with current fire protection programs) that is not currently achieved by most plants. NFPA 805 risk analyses must be compared against the deterministic case (NFPA 805, Section 4.2.4.2). Licensee's that plan to transition to NFPA 805 do not plan to bring their plants into compliance with the RIS and GL provisions prior to transitioning to NFPA 805.

Project Status:

The project status for ONS is provided in Attachment 11. The completion of the fire PRA is the critical path element and is estimated to take 7000-7500 man-hours. The total man-hour estimate for transition is in the neighborhood of 14,000 man-hours. The effort and schedule could be impacted by complications related to multiple spurious component circuit analysis, cable tracing, and lack of experience with the method of NUREG/CR-6850. The transition of ONS is currently scheduled to be complete by the first part of 2007. Near term (6-months) tasks are identified in the handout and items for the next observation meeting include Chapter 3 transition and possible discussions of transient analysis in light of multiple spurious circuit analysis.

The project status for HNP is provided in Attachment 12. Key tasks for 2005-2006 include Chapter 3 transition (including Hemyc issues), nuclear performance analysis transition, and fire PRA. Possible items for the next observation meeting include recovery action evaluations, Chapter 3 transition, and early tasks related to fire PRA. The current schedule indicates HNP transition completion in mid-2009.

Attachments:

1. NFPA 805 Meeting for Oconee and Harris Pilot Plants Agenda, Charlotte, NC, November 7-11, 2005

2. NFPA 805 Meeting for Oconee and Harris Pilot Plants Charlotte, NC, November 7-11, 2005, Parking Lot Issues

3. Duke Power NFPA-805 Transition Pilot Observation Management Kickoff, Oconee, November 7, 2005 - Slide Presentation

4. NFPA 805 NRC Pilot Observation Meeting Progress Energy Introductory Remarks, Paul Gaffney, Progress Energy, November 7, 2005 - Slide Presentation

5. Duke Power Appendix R Reconstitution, Oconee, November 7, 2005 - Slide Presentation

6. Identification and Analysis of Multiple Spurious Component Operation In Support of a New License Basis under NFPA-805, Dennis Henneke, Duke Power, November 7, 2005 - Slide Presentation

7. Duke Power NFPA 805 Ch 4 Methodology Transition Oconee, November 8, 2005 - Slide Presentation

8. NFPA 805 NRC Pilot Observation Meeting Progress Energy Peer Review, Robert Rishel, Progress Energy, November 9, 2005 - Slide Presentation

9. NFPA 805 NRC Pilot Observation Meeting Proposed Risk Impact Review Process, Robert Rishel, Progress Energy, November 9, 2005 - Slide Presentation

10. NFPA 805 NRC Pilot Observation Meeting Change Process, Jeff Ertman, Progress Energy, November 8, 2005 - Slide Presentation

    - Progress Energy, Nuclear Generating Group, Standard Procedure, FIR-NGGC-0010, Fire Protection Program Change Process, Draft Revision 0
    - Examples 2a, 2b, 2d, 3a-c, 4a-c

11. Duke Power NFPA-805 Transition Pilot Observation Project Status, Oconee, November 10, 2005 - Slide Presentation

12. NFPA 805 NRC Pilot Observation Meeting Harris Project Status, Jeff Ertman et. al., November 10, 2005 - Slide Presentation

NFPA 805 Meeting for Oconee and Harris Pilot Plants
Agenda
Charlotte, NC
November 7-11, 2005

Monday, November 7th	1:00 PM to 2:00 PM	Duke's Management Kickoff Presentation
	2:00 PM to 5:00 PM	Duke's Multiple Spurious Licensing Basis
Tuesday, November 8th	8:00 AM to 10:00AM	Duke's Multiple Spurious Licensing Basis (continued)
	10:00 AM to 12:00 Noon	Duke's NFPA (Chapter 4)
	1:00 PM to 5:00 PM	Change Control Process
Wednesday, November 9th	8:00 AM to 12:00 PM	Change Control Process (Continued)
	1:00 PM to 3:00 PM	Progress Energy's Aggregate Review of Deficiencies
	3:00 PM to 5:00 PM	Discussion of PRA Peer Review Process Needs Post-NFPA 805 Update
Thursday, November 10th	8:00 AM to 9:00 AM	Duke Provide Project Status
	9:00 AM to 10:00 AM	Progress Energy Provide Project Status
	10:00 AM to 12:00 AM	Wrap up and planning for future Pilot Meetings

ATTACHMENT 1

NFPA 805 Meeting for Oconee and Harris Pilot Plants Charlotte, NC - November 7-11, 2005 Parking Lot Issues				
No.	Topic	Assigned To	Doc to Update	Schedule Impacts
1.	How will Reactor Oversight Process (ROP) deal with multiple spurious operations? Low significance vs. high significance. Philosophical approach for risk-informed, performance-based (RI-PB) treatment of multiple spurious operations is in Nuclear Energy Institute (NEI) NEI 04-02. 'Endorsement' of process will be accomplished via regulatory guide.	U.S. Nuclear Regulatory Commission (NRC)	ROP (new)	March 2006 Pilot Meeting
2.	Consider Fussell-Vesely risk importance criteria for spurious operations in the gray area. Add more specific discussion of circuit failures (single, multiples, etc.) to transition change analysis discussion and update NEI 04-02.	Henneke/ Ratchford	NEI 04-02	March 2006 Pilot Meeting
3.	Clarify approved/unapproved manual actions for change analysis. Add additional discussion on actions associated with redundant trains/fire affected change/alternative shutdown.	Barrett/ Kleinsorg	NEI 04-02	Need by 11/30/05 for NEI 04-02 Rev. 2
4.	NRC feedback on high-low pressure interface methodology and other items. Clarify in NEI 04-02 that an RI-PB approach could be used for reactor coolant system boundary valve spurious operation using available and developed likelihood values for spurious operation. Position needs to be clarified in Chapter 4 transition, as well as other potential items where NEI 00-01 method may differ from NFPA 805.	Barrett/ Kleinsorg	NEI 04-02, Transition Submittal	Need by 11/30/05 for NEI 04-02 Rev. 2

ATTACHMENT 2

NFPA 805 Meeting for Oconee and Harris Pilot Plants Charlotte, NC - November 7-11, 2005 Parking Lot Issues				
No.	Topic	Assigned To	Doc to Update	Schedule Impacts
5.	Submittal/approval relative to fire probabilistic risk assessment (PRA) peer review. Will the peer review be a prerequisite for license amendment submittal / approval. American Nuclear Society standard development schedule does not support established peer review completion prior to submittal. Issue for 'non-pilot' plants, rather than pilots. NEI peer review process schedule could impact 'non-pilot' transition schedules.	NRC	NRC Reg. Guide, NEI PRA peer review process	March 2006 Pilot Meeting
6.	Non-power operational modes PRA requirements will be a “show stopper”. No existing standards/methods for developing a non-power operational modes PRA assessment. Performance of this analysis would be impossible to meet prior to current transition submittal dates. Proposed addition to Section 4.3.3 of NEI 04-02 being prepared by NRC.	NRC	NEI 04-02	Need by 11/30/05 for NEI 04-02 Rev. 2
7.	NEI 04-02 needs to be more clear on the relationship between NFPA 805 Chapter 3 and 4 requirements. There are a number of sections in Chapter 3 that are dependent upon the requirements for protection in Chapter 4 (e.g., electrical raceway fire barrier system, barriers, suppression, detection). There is potential for misinterpretation if this is not made more clear.	Kleinsorg/ Ratchford	NEI 04-02	Need by 11/30/05 for NEI 04-02 Rev. 2

NFPA 805 Meeting for Oconee and Harris Pilot Plants Charlotte, NC - November 7-11, 2005 Parking Lot Issues				
No.	Topic	Assigned To	Doc to Update	Schedule Impacts
8.	Recommend making nuclear safety questions first in screening reviews in order to determine necessity for Chapter 3 features and systems. Related to question above.	Ertman/ Ratchford	NEI 04-02 / Progress Energy Change Procedures	11/30/05 for NEI 04-02 Rev. 2 (form only, not examples)
9.	Clean up all change evaluation examples and send to NRC. Chapter 3.11.3 (fire barrier) needs to be clarified in transition that "qualification by other means" has to be acceptable to the authority having jurisdiction (AHJ).	Ertman/ Kleinsorg	Change Examples (handouts)/ NEI 04-02	11/30/05 to support NRC Trip Report
10.	Modify NEI 04-02 to "show the path through" fire area boundary qualification. We should provide license amendment request wording to address qualification of fire barriers "Minimal" does not meet the standard but is adequate for the hazard.	Kleinsorg	NEI 04-02	Need by 11/30/05 for NEI 04-02 Rev. 2
11.	Guidance for performing preliminary risk screening. • Manual action timing • Fire frequency impact	Kleinsorg/ Ratchford	NEI 04-02	Not for Rev. 2 of NEI 04-02
12.	Change Question 4.f to "potentially greater than minimal" vs. "greater than minimal" in the change process sheets in Appendix I of NEI 04-02. Also factor risk decreases into the processes.	Henneke / Kleinsorg	NEI 04-02	11/30/05 for NEI 04-02 Rev. 2
13.	How should the screening question be "reviewed" by the PRA engineers? Do all "greater than 'no'" answers need review by the PRA engineers?	Ertman / Barrett	Plant Specific	March 2006 Pilot Meeting

NFPA 805 Meeting for Oconee and Harris Pilot Plants Charlotte, NC - November 7-11, 2005 Parking Lot Issues				
No.	Topic	Assigned To	Doc to Update	Schedule Impacts
14.	Consider having others serve as role of AHJ with respect to prior approval of Ch. 3 anomalies such as NFPA (non-NFPA 805) code deviations on new installed systems, etc.	NRC	Regulatory Guide (later)	March 2006 Pilot Meeting
15.	Should changes developed as part of the nuclear safety transition that are included in the new baseline be tracked for cumulative impact or should the tracking start after definition of the baseline?	NRC	NEI 04-02, Reg Guide	Reg. Guide Public Meeting 12/05
16.	How are interim changes to NEI 04-02 and issues going to be handled administratively, in conjunction with the regulatory guide, given that potential changes are being identified as part of the pilot process and will continue to be identified?	NRC / NEI	TBD	March 2006 Pilot Meeting
17.	Impact of circuit failure draft proposed Regulatory Issue Summary (May 2005) and generic letter (October 2005) on NFPA 805 transition process. Recommend providing feedback to NRC on these implications.	Ertman / Barrett		11/30/05