

NFPA 805 OBSERVATION VISIT TRIP REPORT

Date: October 16 - 19, 2006

Location: Oconee Nuclear Station, Seneca, South Carolina

Attendees: Representatives from the following organizations attended the visit
Duke Power NRC Headquarters
Progress Energy NRC Regions I & II
Kleinsorg Group Pacific Northwest National Lab. (PNNL)
Nuclear Energy Institute (NEI) ERIN Engineering and Research Inc.
Appendix R Solutions

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

Agenda: See Enclosure 1

Summary:

A Nuclear Regulatory Commission (NRC) transition pilot plant observation visit for implementation of Title 10 of the Code of Federal Regulations (10 CFR) 50.48(c) was held with representatives from Progress Energy and Duke Power at Progress Energy Headquarters in Seneca, South Carolina at the Oconee Nuclear Plant. Other utility and industry representatives were also present to observe the proceedings. Progress Energy and Duke Power presented the status for their respective transition projects and specific topics related to 10 CFR 50.48(c) implementation. Enclosure 2 provides a list of issues raised by the observation visit participants and is called the "Parking Lot." The list documents and tracks transition issues from visit to visit. The Parking Lot issues are often resolved by the NFPA 805 Frequently Asked Question (FAQ) Process. Enclosure 3 (ADAMS No. ML070320074) provides the presentations given during the visit. Enclosure 4 provides NRC Staff Issue Summary Sheets. These summaries provide clarification and detail of lessons learned from the NFPA 805 Transition Pilot Program.

General Discussion:

The general objective of the observation visits are to facilitate communications between NRC staff and the pilot plant licensees 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 Regulatory Guide (RG) 1.205; (2) identify regulatory and licensing issues that may impact implementation; and (3) identify improvements and lessons learned to be considered in future inspection procedures and inspector training.

This trip supported the NRC observation visit for on-going pilot-plant activities by Progress Energy and Duke Power 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.

Specific Visit Topics:

This section of the trip report summarizes the specific visit topics identified in the agenda and include information that resulted in identification of new parking lot issues, lessons learned, or other information that has the potential to influence regulatory or industry processes or guidance for implementation of NFPA 805. Enclosure 4 identifies by number, the Issue Summary Sheets associated with the agenda topics.

Agenda Topic 2, Duke Power NFPA 805 Project Status (Handout Reference 1):

Duke Power provided transition status of the Oconee Nuclear Station (ONS). ONS has completed mapping Appendix R (NEI 00-01) methodology to NFPA-805. ONS Units 2 & 3 common reconstitution analysis is complete. Fire hazards analysis validation walkthroughs are compete and under review. Work continues on the Fire probabilistic risk assessment (PRA) activities. Chapter 3 elements mapping into the NEI 04-02, Table B-1 is approximately 80% complete. Near-term tasks include the Chapter 4 transition, Chapter 3 transition, transient analysis, and manual action feasibility. The current ONS schedule shows transition complete in the third quarter of 2007.

Agenda Topic 3, Progress Energy NFPA 805 Project Status (Handout Reference 2):

Progress Energy detailed the transition status for the HNP. Reference 2 includes transition status overview at other Progress Energy plants in addition to HNP. NFPA 805 Chapter 3 and 4 transition tasks are underway. Work continues on the Fire PRA development tasks, MT fire test is complete and a planned Hemyc test. Near-term tasks include Chapter 3 and Chapter 4 transition work as well as detailed fire modeling. The current HNP schedule indicates a May 2008 LAR submittal and transition completion in mid-2009.

Agenda Topic 4, Duke Power Compartment Selection (Handout Reference 3):

The plant's Fire Protection Program defines the fire zones and is the basis for the proposed fire PRA compartment boundaries. These proposed zones have not been based on physical barriers or features that are subject to any rigorous treatment. Discussions with the NRC highlighted concerns with respect to the treatment of such compartments in the Fire PRA and the consistency of that treatment with the guidance provided in NUREG/CR 6850. Duke Power described the overall analysis concept and indicated that latter tasks in the Fire PRA development would ensure that fire zone boundaries would not have any fire containment capability. The underlying concern expressed by the NRC is the difficulty in managing and reviewing an analysis that relies on such complexities and involves departures from the fundamental process described in NUREG/CR 6850. **Issue Summary Sheet 20** documents these concerns.

Agenda Topic 5 & 7, Progress Energy Compartment Selection & Fire Ignition Frequency Calculation (Handout Reference 5):

Progress Energy defines the HNP plant boundary as the plant's protected area. Progress Energy partitioned the plant into 51 Fire Compartments (38 identical to Fire Areas, 10 identical to Fire Zones, and 3 outsides areas with vital equipment). Progress Energy subdivided large fire areas into smaller analysis areas. Several buildings within the plant boundary screened from the analysis (e.g., Security Building, Paint Shop, and Bulk Warehouse).

Reference 5 contains detailed descriptions of the bins, transient frequencies, and fixed ignition sources considered in the analysis. Progress Energy criteria for counting electrical cabinets is different from Oconee's (e.g., counted each cabinet as "1" regardless of size, while small low voltage cabinets with fewer than four switches not counted). **Issue Summary Sheet 21** documented counting criteria concerns. Reference 5, Table 6-1 lists the HNP Total Compartment Ignition Frequencies and Rankings.

Agenda Topic 6, Duke Power Fire Ignition Frequency Calculation (Handout Reference 4):

Duke Power presented information concerning their NUREG/CR-6850, Task 6, "Fire Ignition Frequency" efforts. During their initial walkdown, Duke Power noted the lack of detailed criteria and performed a verification walkdown to refine the criteria. Duke Power held significant discussion on high-energy arcing faults (HEAF) and how to treat low energy switchgear and motor control centers. Additional discussion held on control room cabinets and the classification of these cabinets as Bin 4 or Bin 15 (Table 6-1, NUREG/CR-6850). They discussed the method of counting electrical cabinets and whether cabinet size is a consideration. The main areas of question were associated with HEAFs, Control Cabinets counting, and counting of all electrical cabinets. Additional items related to ignition source counting need additional clarification.

Issue Summary Sheet 21 documents these counting concerns.

Oconee uses armored cables so it had not identified any self-igniting cable fires (Bin21). A review of site data revealed that only one event met the criteria for updating the generic data. Duke Power performed a Bayesian update for this one event and the Oconee compartment fire frequencies have been determined, but additional refinements are likely as issues are resolved and further guidance provided on binning criteria.

Agenda Topic 8, Duke Power Component Selection (Handout Reference 6):

Duke Power presented information on the progress of the Fire PRA activities. This included details of the development of the Fire PRA component list, disposition of PRA basic events. Duke Power uses six disposition bins to determine if a PRA event is linked or ignored. The presentation included information on each of the bins. A PRA model change is required for those items in the Safe Shutdown Equipment List (SSEL) that cannot be dispositioned. Duke Power's handling of multiple spurious requires new sequences, but no new components in the PRA model. The methods used, including expert panel, to identify the new sequences were presented. The treatment of instrumentation and diagnostic equipment requires linking SSEL entries to Control Room operator actions. A planned simulator review will confirm the modeling assumptions.

Agenda Topic 9, Progress Energy Component Selection, Future Fire PRA Discussion (Fire PRA Cable Selection and Fire PRA Model Development), and Internal Events PRA Update (Handout References 7 - 9):

HNP Fire PRA component selection (Task 2) includes SSEL dispositioning; dispositioning the PRA equipment list; identifying new PRA sequences; identifying cable routing priorities; and treatment of operator actions as well as handling multiple spurious operation (MSO). An expert panel methodology identified MSOs of concern. New PRA sequences derived from new PRA components/failure modes from SSEL, comparison of SSA and PRA system functions and end-states, and reviewing previously screened initiators. Treatment of operator actions (to be addressed later) could add more components to the PRA. Output from Task 2 includes a list of SSEL tags for PRA modeling (input to Task 5), and a list of PRA

components for cable routing (input to Task 3). Progress Energy's next PRA tasks are Task 3, "Cable Selection," Task 5 "Fire-Induced Risk Model," and Task 8, "Scoping Fire PRA."

Agenda Topic 10, Duke Power Future PRA Change (Handout Reference 10):

Duke Power presented the status and plans for NUREG/CR-6850's Tasks. Tasks 1 and 6 (Partitioning and Ignition Frequency) are documented in a single calculation. Task 2, "Component Selection" calculation is complete, but needs a section for Task 3, "Cable Selection". Task 3 activities build on an existing Appendix R Reconstitution cable database (ARTRAK), while adding "Y2" cables as well special treatment for interlocked components. Task 4, "Qualitative Screening" was skipped. Task 5, "Fire-Induced Risk Model" introduces 10 new sequences (see Reference 10, page 7) as well as other model changes, is modeled in FRANC software, and is ready for initial quantification and document development. Next steps include identifying screened compartments, scoping fire modeling, and scenario walkthroughs.

Agenda Topic 11, Parking Lot Issues (Enclosure 2):

See separate discussions below and Enclosure 2. Discussions during this period indicate there is potential confusion over the role of 10 CFR 50.48(a) for a plant that is transitioning to NFPA 805, **Issue Summary Sheet 22**.

Parking Lot Issues Summary:

The attached parking lot (Enclosure 2) was initiated at the first observation in November 2005. The summary documents the issues and needs identified during observation visit presentations and related discussions. NRC and Industry use this summary to track issues, revise existing items as necessary, and open new items for issues identified during follow-on observation visits.

During the October 2005 observation visit, five new items were identified and eleven items from the November 2005 visit were closed. Additional details were provided on actions taken, a short summary of the visits' discussions on the specific issues is added, and whether a FAQ is associated with an item.

Issue Summary Sheets

Following the March visit, the NRC staff determined that additional information, clarification, and detail (to that provided in the parking lot table) was needed to convey pilot-plant identified issues and lessons learned to the non-pilot licensees and other interested parties. Enclosure 4 provides the Issue Summary Sheets combine with the related parking lot issues.

Plans for Next Observation Visit:

We discussed future observation visits and a tentative schedule for working level visits. In November 2006, a plant visit to Progress Energy's, Shearon Harris Nuclear Power Plant is scheduled to review the fundamental program transition activities, NFPA 805 Chapter3.

Enclosures:

1. NFPA 805 Transition Observation Visit at Oconee Nuclear Station, Agenda, Seneca, SC, October 16 - 19, 2006
2. NFPA 805 Transition Observation Visit at Oconee Nuclear Station, Parking Lot, Seneca, SC, October 16 - 19, 2006
3. NFPA 805 Transition Observation Visit at Oconee Nuclear Station, Handouts, Seneca, SC, October 16 - 19, 2006 (ADAMS No. ML070320074)
4. NFPA Pilot-Plant Implementation Issue Summary Sheets

Handout References (ADAMS No. ML070320074):

1. Duke Power NFPA 805 Transition Pilot Observation Project Status, Harry Barrett, Duke Power, October 17, 2006 - Visit Agenda Topic 2 - Slide Presentation
2. NFPA 805 Pilot Observations Visit Progress Energy Transition Status, Jeff Ertman, Progress Energy, October 6, 2006 - Visit Agenda Topic 3 - Slide Presentation
3. Task 1, Duke Power, FPRA Pilot Visit, Brandi Weaver, Duke Power October 16, 2006 - Visit Agenda Topic 4 - Slide Presentation
4. Task 6, Duke Power, FPRA Pilot Visit, Brandi Weaver, Duke Power, October 16, 2006 - Visit Agenda Topic 6 - Slide Presentation
5. Harris Nuclear Plant (HNP) Ignition Frequency Calculation, David Miskiewicz, Progress Energy, October 17, 2006 - Visit Agenda Topic 7 - Slide Presentation
6. Task 2, Component Selection, Duke Power, FPRA Pilot Visit, Ed Simbles, Duke Power, October 16, 2006 - Visit Agenda Topic 8 - Slide Presentation
7. Harris Nuclear Plant (HNP) Fire PRA Components Selection, David Miskiewicz, Progress Energy, October 18, 2006 - Visit Agenda Topic 9.a - Slide Presentation
8. Harris Nuclear Plant (HNP) Next PRA Tasks, David Miskiewicz, Progress Energy, October 18, 2006 - Visit Agenda Topic 9.b - Slide Presentation
9. Harris Nuclear Plant (HNP) Internal Events PRA Update, David Miskiewicz, Progress Energy, October 18, 2006 - Visit Agenda Topic 9.c - Slide Presentation
10. Looking Ahead, Tasks 3, 4, and 5, Duke Power, FPRA Pilot Visit, David Bidwell, Duke Power, October 18, 2006 - Visit Agenda Topic 10 - Slide Presentation

Enclosure 1
 Trip Report
 Pilot Plant Observation Visit
 October 16 - 19, 2006

NFPA 805 Visit for Harris and Oconee Pilot Plants NRC Observation Visit Topics and Agenda, Seneca, SC				
		Topic	Lead Presenter	Topic Notes
Monday October 16	1330 – 1500	Processing Tour Participants (Security Badging, Dosimetry, etc.)	N/A	
	1500 – 1700	Oconee Plant Tour	N/A	
Tuesday October 17	0900 – 0915	Introductions, Visit Kickoff	Barrett	Topic 1
	0915 – 0945	Duke Power NFPA-805 Project Status	Barrett	Topic 2, Reference 1
	0945 – 1015	Progress Energy (PE) NFPA 805 Project Status	Ertman	Topic 3, Reference 2
	1015 – 1030	Break		
	1030 – 1115	Duke Power Compartment Selection	Weaver	Topic 4, Reference 3
	1115 – 1200	PE Compartment Selection	Miskiewicz	Topic 5
	1200 – 1300	Lunch		
	1300 – 1430	Duke Power Fire Ignition Frequency Calculation	Weaver	Topic 6, Reference 4
	1430 – 1445	Break		
Wednesday	1445 – 1615	PE Fire Ignition Frequency Calculation	Miskiewicz	Topic 7, Reference 5
	0800 – 1000	Duke Power Component Selection	Simbles	Topic 8, Reference 6

NFPA 805 Visit for Harris and Oconee Pilot Plants NRC Observation Visit Topics and Agenda, Seneca, SC				
		Topic	Lead Presenter	Topic Notes
Wednesday October 18	1000 – 1100	PE Component Selection, Future Fire PRA Discussion (Fire PRA Cable Selection and Fire PRA Model Development), and Internal Events PRA Update	Miskiewicz	Topic 9, Reference 7 - 9
	1100 – 1200	Duke Power – Future PRA Change	Bidwell	Topic 10, Reference 10
	1200 – 1300	Lunch		
	1300 – 1500	Additional Plant Tour (Limited plant tour to specific areas of interest only)	N/A	
	1500 – 1700	Update Parking Lot	Barrett	Topic 11, Enclosure 2
Thursday October 19 Information Sharing Visit ¹	0900 – 1100	Review Updated Old and New Parking Lot issues	Ertman/Barrett	Topic 11 Summary Enclosure 2
	1100 – 1200	Duke Power and Progress Energy Presentation Material from Oct. 17 &18	Ertman/Barrett	Topics 1 – 10 Summary References 1 – 10
	1200 – 1300	Lunch		
	1300 – 1630	Duke Power and Progress Energy Presentation Material from Oct.17 & 18	Ertman/Barrett	Topics 1 – 10 Summary References 1 - 10

¹ Information Sharing Meeting was open to invited utilities and selected consultants.

Enclosure 2 Trip Report
 Pilot Plant Observation Visit
 October 16 - 19, 2006

NFPA 805 Transition Observation Visit & Information Sharing Visit Seneca, SC - October 16 - 19, 2006 – Enclosure 2: Updated Parking Lot							
No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
1	<p>How will Reactor Oversight Process deal with multiple spurious operations? Low significance vs. high significance.</p> <p>Philosophical approach for RI-PB treatment of multiple spurious operations is in NEI 04-02. 'Endorsement' of process will be accomplished via Reg. Guide.</p>	Duke Power / Progress Energy	<p>ROP (new) / NEI 04-02</p> <p>Methodology for Expert Panel Update</p> <p>Markup to P. Lain 3/28/06 flowchart</p> <p>Review of MC 0612</p>	11/6/06 (HNP Pilot Mtg)	<p>NRC (Paul Lain) presented flowchart for "unevaluated Multiple Spurious operations" on 03/27/06. It included a screening process that included CAP and comp. measure inclusion, and documentation of the issue as a potential URI based upon risk significance.</p>	<p>Concerns and questions were raised about the process and the burden associated with URIs.</p> <p>March 2006 Action Items</p> <p>Look at minor violation questions for MC 0612 – to see if 'potential multiple spurious operation findings' are adequately addressed.</p> <p>1E-08 threshold for screening. Is it an appropriate value to use and consistent with the ROP? (NEI 04-02, NUREG-6850, RG 1.205)</p> <p>Pilot plants to provide comments on NRC flowchart and potential changes to NEI 04-02.</p>	Potential
2	<p>Consider Fussell-Vesely risk importance criteria for spurious operations in the gray area.</p> <p>Add more specific discussion of circuit failures (single, multiples, etc.) to transition change analysis discussion and update NEI 04-02.</p>	Henneke Ratchford	NEI 04-02	March 2006 Pilot Visit	<p>Visit in CLT in Jan. 2006 determined additional guidance is not appropriate in NEI 04-02 until further along in the Pilot PRA efforts. Dennis will present spurious actuation methods at March 2006</p>	<p>Ongoing effort, Item will remain open to allow pilot efforts to 'test drive' the process.</p> <p>[CLOSED]</p>	No

NFPA 805 Transition Observation Visit & Information Sharing Visit
Seneca, SC - October 16 - 19, 2006 – Enclosure 2: Updated Parking Lot

No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
3	<p>Clarify approved/unapproved manual actions for change analysis. Add additional discussion on actions associated with redundant trains/fire affected train/alternative shutdown.</p> <p>March 2006 Update What constitutes prior approval of operator manual actions (See NEI 04-02 B2.2.4)? As part of submittal, should we provide an estimate of delta-CDF to the NRC (in addition to the total delta-CDF being reported as part of RG 1.205)? The NRC stated that a specific approval in an Appendix R III.G.2 SER (without a 10 CFR 50.12 exemption) does not constitute prior approval of manual actions for the purposes of compliance with existing regulations for non-NFPA 805 plants or for change evaluations during transition (for NFPA 805 plants); however, these SERs are part of our licensing basis.</p>	NEI	NEI 04-02 a. FAQ – III.G.2 OMAs b. FAQ – SER approval	a. 05/31/06 b. 06/30/06	Figure B-4 added to NEI 04-02 rev. 2 reflects the concept of III.G.1 (fire-affected train) manual actions. At 3/1/06 NRC public meeting, the NRC (Klein) discussed that 'fire affected train manual actions were not considered unapproved (for the context of 'change' for the NFPA 805 transition). Industry requested clarification in writing.	a. NEI will add new figure to NEI 04-02 to include fire affected train operator manual actions (where credited train is protected in a fire area, e.g., 3-hour wrap, which includes the fire affected train operator manual action). NEI will submit a letter to clarify manual action items from 3/1/06. The upcoming RIS on manual actions may provide additional clarification. b. NRC requested that the pilot plants make a proposal on how to address the 'incorrect approval' of 'SER approved' Appendix R III.G.2 manual actions. This proposal should consider input from the manual action RIS scheduled to be issued in June 2006.	Closed to FAQ 06-0001 and 06-0012 October 2006
4	<p>NRC feedback on high-low pressure interface methodology and other items.</p> <p>Clarify in NEI 04-02 that an RI-PB approach could be used for RCS boundary valve spurious operation using available and developed likelihood values for spurious operation.</p> <p>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.</p>	NEI	FAQ 06-0006	05/30/06	NEI 00-01 methodology comparisons are in progress at the pilot plants. Nothing specific changed in NEI 04-02 rev. 2 yet.	Need to clarify in NEI 04-02 that the guidance in NEI 00-01 is consistent with NFPA 805 definition.	Closed to FAQ 06-0006 October 2006

NFPA 805 Transition Observation Visit & Information Sharing Visit
Seneca, SC - October 16 - 19, 2006 – Enclosure 2: Updated Parking Lot

No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
5	<p>Submittal/approval relative to Fire PRA peer review. Will the peer review be a prerequisite for license amendment submittal / approval?</p> <p>ANS standard development schedule does not support established peer review completion prior to submittal.</p> <p>Issue for 'non-pilot' plants, rather than pilots. NEI peer review process schedule could impact 'non-pilot' transition schedules.</p>	NRC	NRC Reg. Guide, NEI PRA peer review process	March 2006 Pilot Visit	<p>NRC provided specific information in the Draft Reg. Guide 1.205 in Feb. 2006. Discussed at meetings with NRC on 2/27/06 and 3/3/06.</p>	<p>RG 1.205 draft includes specific information on peer review. RG 1.205 will state that the licensees fire PRA must be subject to a peer review process or NRC review process as part of transition.</p> <p>NEI to develop peer review process for non-pilots.</p> <p>PE requested that reviews be conducted of PRA by the NRC prior to performing change evaluations to gain level of confidence prior to significant effort on change evaluations. NRC stated that they would be agreeable to these types of reviews. Need to schedule future pilot items on PRA review.</p> <p>Add information in NEI 04-02 include information from RG 1.205 on the peer review process (that was added prior to the 2/27/06 Public Meeting).</p> <p>[NRC Handout 03/28/06] [CLOSED]</p>	No
6	<p>Non-power operational modes PRA requirements will be a 'show stopper'. There are no existing standards/methods for developing a non-power operational modes risk assessment. This would make the performance of this analysis impossible to meet prior to current transition submittal dates.</p> <p>Proposed addition to Section 4.3.3 of NEI 04-02 being prepared by NRC.</p>	NRC	NEI 04-02	Need by 11/30/05 for NEI 04-02 Rev. 2	<p>NRC provided specific information in a draft markup of App. F to NEI 04-02 Rev. 1.</p> <p>Feedback to the NRC from NEI was that the proposed changes were unacceptable to the industry.</p>	<p>No changes to NEI 04-02 Rev. 1 regarding the non-power operational modes are proposed by the NRC as part of RG 1.205. The NRC handout states that "the NRC accepts the guidance provided in NEI 04-02 Rev. 1 regarding the issue."</p> <p>[NRC Handout 03/28/06] [CLOSED]</p>	No
7	<p>NEI 04-02 needs to be clearer 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., ERFBS, barriers, suppression, and detection). There is potential for misinterpretation if this is not made clearer.</p>	PE	NEI 04-02 FAQ / Equivalent PE letter	04/15/06	<p>Updated NEI 04-02 Rev. 2</p> <p>Section 5.3 and Appendix B to include more discussion of requirements for protection and flowcharts (in App. B) to assist in determining which systems and features are 'required' by Ch. 4 of NFPA 805.</p>	<p>Revision 2h sent to NRC includes flowcharts in Appendix B on the relationships between NFPA 805 Chapter 4 requirements and 'required' systems for NFPA Chapter 3.</p> <p>Resend with a letter on specific issues. Will request an expedited review.</p> <p>Concerns were identified by the NRC over the RG 1.174 acceptance criteria for risk significance of fire protection systems/features in Appendix B to NEI 04-02.</p> <p>Editorial correction: Add "no" to ERFBS flowchart (Figure B-2 of Draft 2h o NEI 04-02).</p>	Closed to FAQ 06-0004 October 2006

**NFPA 805 Transition Observation Visit & Information Sharing Visit
Seneca, SC - October 16 - 19, 2006 – Enclosure 2: Updated Parking Lot**

No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
8	Recommend making nuclear safety questions first in screening reviews in order to determine necessity for Chapters features and systems. Related to question above.	PE	NEI 04-02 FAQ / Equivalent PE letter	04/15/06	NEI 04-02 Rev. 2 Section 5.3 and Appendix I reflect the revised order of questions.	NEI 04-02 Rev. 2h changes presented to the group. NEI will send in the proposed changes to NRC with the letter.	Closed to FAQ 06-0002 October 2006
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 AHJ.	Ertman Kleinsorg	Change Examples (handouts) / NEI 04-02	11/30/05 to support NRC trip report	New change evaluation examples to be reviewed during March pilot.	[CLOSED to No. 10]	No
10	Modify NEI 04-02 to “show the path through” fire area boundary qualification. We should provide LAR wording to address qualification of fire barriers “Minimal” does not meet the standard but is adequate for the hazard.	NEI	Develop alternative methodology for performing Engineering Equivalency Evaluations	07/31/06 (draft) 10/06 pilot vet process FAQ (TBD)	Figure B-3 of NEI 04-02 draft provides flowchart of requirements for fire barriers. This is related to ability to transition and perform ‘adequate for the hazard’ fire barrier evaluations (LAR approach).	Will put the ‘alternate methodology process’ in future revision to NEI 04-02 and individual licensees will refer to it in their LAR. Discussed LAR process for existing engineering equivalency evaluations that is planned to be added to a future revision to NEI 04-02. Agreed that it would be discussed at the next pilot visit.	Closed to FAQ 06-0008 October 2006
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	Will be developed further as PRA results are obtained.	Will add examples in the future. Does not warrant inclusion in the parking lot. [CLOSED]	No
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. In addition, factor risk decreases in to the processes.	PE	FAQ / Equivalent PE letter	04/15/06	Updated NEI 04-02 Rev. 2 Section 5.3 and Appendix I.	NEI 04-02 Rev. 2h changes presented to the group. Will be submitted along with other NEI 04-02 changes.	Closed to FAQ 06-0003 October 2006
13	How should the screening question be “reviewed” by the PRA engineers? Do all “Greater than ‘no’” answers need to be reviewed by the PRA engineers?	Ertman Barrett	Plant specific	March 2006 Pilot Visit	Not a major issue.	Does not warrant inclusion in the parking lot. [CLOSED]	No

NFPA 805 Transition Observation Visit & Information Sharing Visit
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No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
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 Visit	Draft RG 1.205 from Feb. 2006 is clear that NRC is the AHJ.	[NRC Handout 03/28/06] RG 1.205 draft and handout provide clarifications. [CLOSED to No. 10]	No
15	Match up NEI 04-02 with RG 1.205 for baseline (Section 2.2 of Draft RG 1.205)	NEI	FAQ	07/31/06		Need update to NEI 04-02 to clarify that upon completing transition to an NFPA 805 licensing basis, the baseline FPP risk will be the risk of the plant as-designed and operated according to the NRC-approved licensing basis.	Closed to FAQ 06-0010 October 2006
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 Visit	Timeline and plan prepared and presented at 3/3/06 NRC workshop. Will be discussed at March 2006 Pilot visit,	Discussed in detail on 3/27/06. Frequently Asked Question (FAQ) process used for ROP performance indicator (PI) was presented as an example process to be used for addressing 'parking lot' items for the pilot plants and for non-pilot transitioning plants. [CLOSED]	No
17	Impact of circuit failure draft proposed RIS (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	Harry B. provided input to Sunil on the topic.	Ray G. provided handout on process for doing transition evaluation in order to try to simplify process. Basically involved calculating a new CDF and assuming it as a 'surrogate change' for the purposes of transition acceptability. The process then did progressive additional work to look at the change based upon the safety significance and acceptability determination. [CLOSED]	No
	Items started at PE Pilot (March 2006)						
18	Format for NEI 04-02 Appendix B NSPA methodology transition process. Based on ONS pilot efforts, may need to revise NEI 04-02 table process to more of a guidance document.	Duke Power	Duke Power / NEI provide alternative method for NEI 04-02	05/31/06 (draft)		NRC (P. Lain) discussed concerns with communicating items of concern to non-pilot transitioning plants. NEI 04-02 may be revised to provide alternative approaches to completing comparison tables for the NEI 00-01 NSPA methodology comparison.	Closed to FAQ 06-0013 October 2006

**NFPA 805 Transition Observation Visit & Information Sharing Visit
Seneca, SC - October 16 - 19, 2006 – Enclosure 2: Updated Parking Lot**

No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
19	Need to provide definitions and examples of related and unrelated changes. Include examples in NEI 04-02. (For example: what "CDF" element is affected?). This discussion occurred as part of Parking Lot item 15. Also need to determine how PRA updates (model changes, method changes, etc) are considered? Are they changes, do previous changes need to be re-evaluated?	PE	Draft methodology and examples	07/31/06		Related to Parking Lot Item 24.	Closed to FAQ 06-0005 October 2006
20	NRC provide any specific needs for "in progress" Fire PRA Peer Review. This is relative to NRC stated intent to credit the observation process instead of a Peer Review.	NRC and Progress Energy	Provide proposed schedule at Nov. 2006 Pilot Mtg for NRC review of PRA task documents (estimated Jan. – Feb. 2007)	11/6/06		Discussed at Oct. 2006 Pilot Mtg.	None
21	Reconciliation of different risk acceptance thresholds (RG 1.205, ROP acceptance, MSO acceptance).	Duke Power / Progress Energy	Table of data and recommendations for change. Create FAQ?	4/30/07		Discussed at Oct. 2006 Pilot Mtg. Guidance will be needed prior to performance of change evaluations.	Potential
22	Update Appendix I of NEI 04-02 to include non-power operational mode change evaluation.	NEI	Create FAQ to provide specific guidance.	05/31/07			Potential
23	Discussion was held over wording related to FPP systems and features. Questions were asked about "...fire protection systems and features relied upon to meet FPP nuclear safety and radioactive release performance criteria) not required by NFPA 805...." And configuration management. Additional discussion was held over "what constitutes an FPP change".	PE	Draft methodology and examples of what constitutes a fire protection program change	07/31/06			Closed to FAQ 06-0005 October 2006

**NFPA 805 Transition Observation Visit & Information Sharing Visit
Seneca, SC - October 16 - 19, 2006 – Enclosure 2: Updated Parking Lot**

No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
24	<p>[NRC Handout 03/28/06] NRC expressed concern over “dividing up” individual changes that are small (that are acceptable individually), but are not acceptable cumulatively.</p> <p>Potential solutions:</p> <ul style="list-style-type: none"> • Screening out of changes at very low values. • Screening method for determining threshold for tracking cumulative changes (“related”) • Define related (how are features that are going to be tracked for cumulative affect) (Section 3.2.5 and 3.2.6 of RG 1.205) 	PE	Draft revision of NEI 04-02 to address the screening, processing and tracking of changes.	06/30/06		<p>Draft RG 1.205 (Feb. 2006) states that changes associated with the new post-transition baseline do not have to be tracked in the future.</p> <p>Ray G. provided handout on tracking post-transition cumulative changes that tracks all changes back to baseline.</p> <p>Related to Parking Lot Item 19.</p>	Closed to FAQ 06-0014 October 2006
	Items started at ONS Pilot (October 2006)						
25	ONS Fire PRA are based on the fire zones as defined in the FP Program, which are not necessarily based on physical barriers or features that are subject to any rigorous treatment. The discussion with the NRC highlighted concerns with respect to the treatment of such compartment in the Fire PRA and the consistency of that treatment with the guidance provided in NUREG/CR-6850. Questions arose over impact of this approach on other tasks and level of documentation needed to justify this approach.	Duke Power	Provide clarification on methodology.	TBD		High priority	Potential

**NFPA 805 Transition Observation Visit & Information Sharing Visit
Seneca, SC - October 16 - 19, 2006 – Enclosure 2: Updated Parking Lot**

No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
26	The NUREG/CR- 6850 methodology includes a specific frequency bin for the treatment of the main control board in the Main Control Room (Bin 4 of Table 6-1). While the general description of this board by making reference to the 'horseshoe', is generally correct, there are control room layout details that create some ambiguity, and the potential to characterize other electrical panels/cabinets as Bin 15. The guidance in NUREG 6850 is not clear enough to result in consistent application.	Duke Power	Provide clarification on methodology (FAQ?)	11/6/06 (HNP Pilot Mtg.)		High priority	Potential
27	NUREG/CR-6850 does not provide explicit guidance for the counting of plant electrical cabinets. Two basic approaches were debated. The Method 1 approach would count each individual electrical cabinet based on the physical boundaries of that cabinet independent of size or length. Method 2 would count electrical cabinets based solely on size.	Duke Power and Progress Energy	Provide clarification on methodology (FAQ?)	11/6/06 (HNP Pilot Mtg.)		High priority	Potential

**NFPA 805 Transition Observation Visit & Information Sharing Visit
Seneca, SC - October 16 - 19, 2006 – Enclosure 2: Updated Parking Lot**

No	Topic	Assigned To	Actions	Schedule	Action Taken	March/October 2006 Discussion	FAQ Action
28	The overall counting method guidance for switchgears, load centers, unit substations, and bus ducts is not completely clear. The concern is that counting these component types for Bin 16 using the Bin 15 method could result in a fire frequency distribution for HEAFs for switchgears and load centers that is inconsistent with industry experience in that the HEAF on the load centers and load centers would be much more frequent as compared to switchgears. A proposed change to the counting method for this bin is proposed so that the HEAF frequency for low voltage equipment would be weighted to a lesser degree.	Duke Power / Progress Energy	Provide clarification on methodology (FAQ?)	11/6/06 (HNP Pilot Mtg.)		High priority	Potential
29	Miscellaneous ignition frequency binning issues. Questions arise during ignition frequency counting, such as: <ul style="list-style-type: none"> o MOV motors o Hydraulic actuators for valves o Transformers. 	Duke Power / Progress Energy	Provide clarification on methodology (FAQ?)	12/31/06		High priority	Potential
30	There is potential confusion over the role of 10 CFR 50.48(a) for a plant that is transitioning to NFPA 805. This may impact the scope of the transition and post-transition program management.	Duke Power	Provide clarification on the role of 10 CFR 50.48(a) with a post-transition fire protection program.				

Enclosure 3 Trip Report
Pilot Plant Observation Visit
October 16 – 19, 2006

Presentation Handouts
NFPA 805 Transition
Pilot Plant Program
ML070320074

Enclosure 4 Trip Report
Pilot Plant Observation Visit
October 16 - 19, 2006

Issue Summary Sheets

NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 1

Topic: Multiple Spurious Operation - Treatment of newly identified multiple spurious operations in Reactor Oversight Process (ROP) prior to risk significance determination

Associated Observation Visit Parking Lot Item(s): 1

Description: NEI 04-02, Appendix B-2 describes the proposed industry approach to evaluating multiple spurious operations, which in turn, references NEI 00-01. The proposed approach is to analyze all single spurious operations and risk-significant multiple spurious operations. The approach includes a provision that newly identified multiple spurious operations will not be considered part of the licensing basis unless determined to be risk significant. The issue requiring further evaluation is how the reactor oversight process (ROP) will exclude newly discovered multiple spurious circuits from the license basis, until they are determined to be risk significant.

Status: OPEN. The November 2005 pilot-plant observation visit initially identified this issue. The NRC Staff reviewed the ROP relative to the treatment of newly identified multiple spurious operations that have unknown risk significance.

At the March 2006 pilot plant observation visit, the Staff presented a flow chart, illustrating how newly found multiple spurious circuits identified during an inspection, could be treated (See flow chart below). In addition to the flowchart, the following information was discussed:

- If circuits identified by an inspector and its related contributors were omitted, and their contribution to risk; are “greater than Green” OR “constitute a violation of defense-in-depth” or “safety margins,” in spite of using an appropriate screening tool, the issue would constitute a minor violation. If the inspector determines that the licensee’s screening tool is flawed, that would constitute a violation. Here “related contributors” are those that are associated via the same root cause, fire scenario, or fire area.
- If the circuit issue identified by the inspector and its related contributors that were also omitted are “less than Green” AND “do not constitute a violation of defense-in-depth” or “safety margins” AND the licensee has used an appropriate screening tool, no further action is warranted. However, if the inspector determines that the licensee’s screening tool is flawed, that would constitute a minor violation.

The process outlined in the flowchart documents (new) unevaluated multiple spurious operations as unresolved items (URI) and proposes a risk threshold below which the multiple spurious operation is screened (a potential threshold for such “treatment” of 1 E-08/yr delta-CDF [1 E-09/yr delta LERF] was offered for discussion). Industry raised the concern that documenting all multiple spurious operations as URIs pending evaluation will create a significant cost and resource impact because all URIs must be formally dispositioned and even those classified as minor can require 1000 hours. Industry’s preference would be to not treat the new multiple spurious as a URI, but to disposition the issue within the fire probabilistic safety assessment (PSA) process. Consensus was to review the minor questions in Inspection Manual Chapter (IMC) 0612, and suggest development of new questions if necessary such that multiple spurious operations below a certain threshold could be relegated to minor and treated accordingly.

Resolution Action(s)/Action Party: OPEN. Industry and pilot-plant participants agreed to review the flowchart, IMC 0612 questions, screening thresholds and provide feedback to the NRC at the next observation visit. The industry may also submit an FAQ on the issue.

Associated FAQ: Planned, but not submitted.

Lesson Learned: Pending resolution of issue.

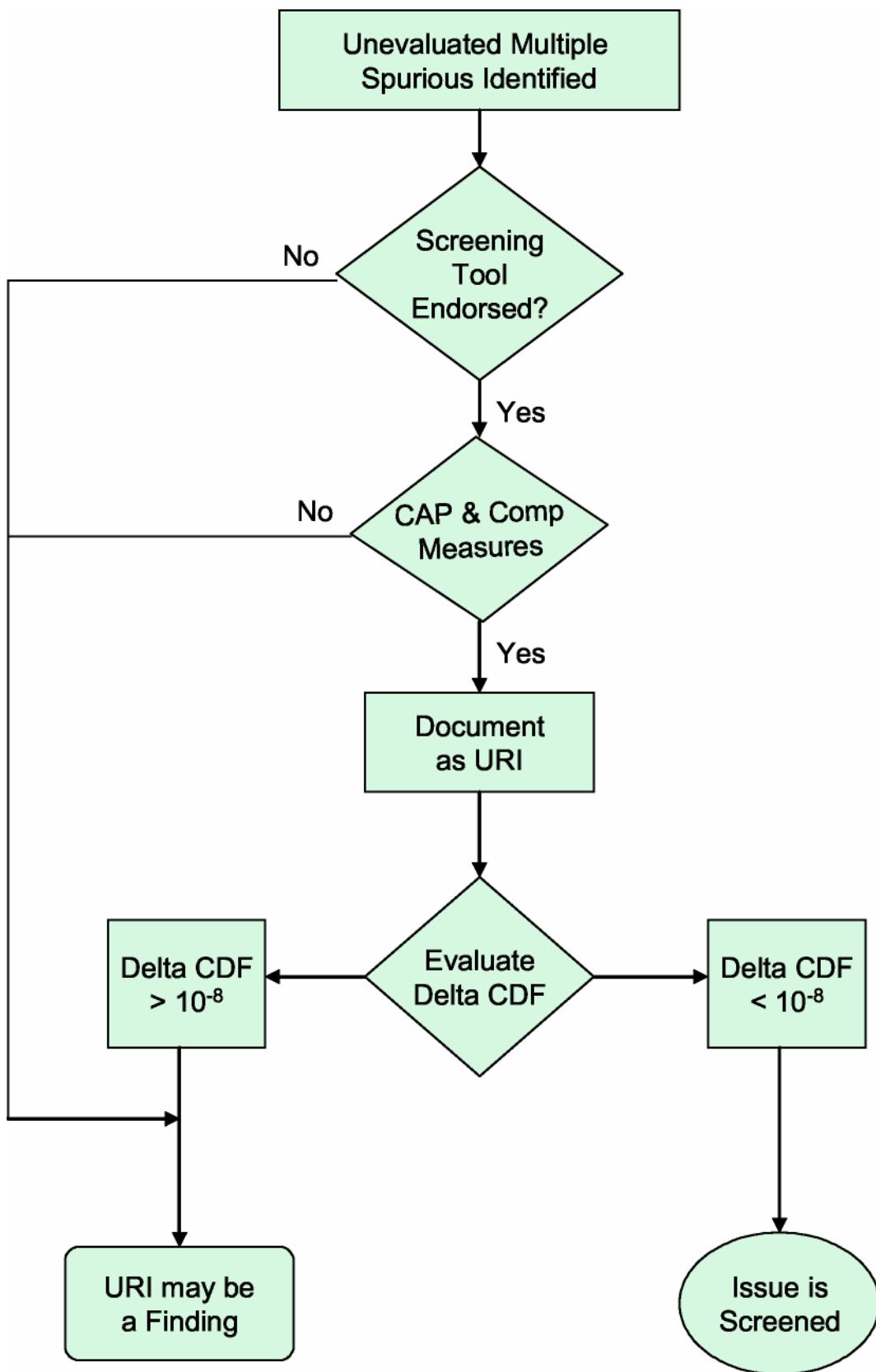


Figure 1. Multiple Spurious Post-Transition Inspections

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 2**

Topic: Multiple spurious operations - screening criteria

Associated Observation Visit Parking Lot Item(s): 2

Description: Duke Power presented its methodology for identification and analysis of multiple spurious operations during the November 2005 observation visit (See November 2006 Trip Report Handout Reference 4). During the visit, the participants held considerable discussion with regard to screening and treatment of newly identified multiple spurious operations. The Duke Power approach considers newly identified spurious operations as outside the license basis until risk significance is determined. One suggested approach to establishing risk significance was the use of Fussell-Vesely (F-V) risk importance criteria.

This topic arose from a more general discussion on a proposed method to perform an acceptable transition change evaluation. A fire PSA that represents the plant “going forward” (GF) would be performed, i.e., crediting any modifications/changes to be implemented as part of the transition. This would be compared against an “ideal” fire risk if all-deterministic compliance were strictly met, yielding a fire delta-CDF (using CDF as the risk metric) = (fire-CDF-GF) minus (fire-CDF-ideal). The fire-CDF-ideal need not be calculated from a separate full fire PSA, but rather using the F-V risk importance measures (indicating the fractional contribution of fire-induced failures to the fire CDF) associated with “non-compliance” as determined from the fire-CDF-GF. The sum of these F-V values would conservatively bound the delta-CDF. In the case where this bounding technique proved too conservative, Issue Summary Sheet 13 discusses some relaxations.

Resolution Action(s)/Action Party: CLOSED. The spurious operations evaluation methodology continues to evolve, and this specific issue was determined to be no longer relevant and the issue closed in the March 2006 visit.

Associated FAQ: None.

Lesson Learned: As experience grows during transitioning the pilot-plants to a risk-informed, performance-based fire protection program, PSA methods and application to analyze spurious operations and plant change continue to evolve. As the PSA methods and process output become finalized and confirmed by peer review, NEI 04-02 will be revised, as appropriate, to provide the necessary guidance for implementing/applying these methods. At this time, no specific changes to the guidance were proposed.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 3**

Topic: Transition of operator manual actions (OMA) to NFPA 805 Recovery Actions

Associated Observation Visit Parking Lot Item(s): 3

Description: NEI 04-02, Revision 1, Section 2.3.1 and Appendix B-2 discuss the direct transition of previously approved program elements to the new program. Elements that do not meet the previous approval criteria should be addressed via the change evaluation process. Specific concerns have been expressed by industry with regard to transition of OMAs currently relied on to demonstrate compliance with 10 CFR 50, Appendix R, III.G.2, and the approval of which may be explicitly or implicitly addressed in a NRC Safety Evaluation Report (SER). (Ideally, OMA approval would be documented within an SER.) The NRC has established the position that OMAs are not an acceptable method to demonstrate compliance with 10 CFR 50, Appendix R, III.G.2; do not meet the deterministic criteria of NFPA 805, Chapter 4; and therefore must be addressed via a plant change evaluation. The NRC's position is in Regulatory Guide (RG) 1.205, Section 2.3, and Regulatory Issue Summary (RIS) 2006-10.

Considerable discussion was held during the November and March pilot-plant observation visits regarding transition of OMAs for safe shutdown, what documentation constitutes NRC approval of those OMAs, and how to disposition those manual actions relied on to demonstrate compliance with 10 CFR 50, Appendix R, III.G.2.

Resolution Action(s)/Action Party: OPEN. Pending approval of FAQs that clarify the approach to transitioning OMAs to Recovery Actions. The FAQs proposes necessary changes to NEI 04-02.

Associated FAQ: FAQ 06-0001 and 06-0012

Lesson Learned: Pending final resolution of FAQ.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 4**

Topic: Spurious Operations - Risk informed, performance-based treatment of high-low pressure interface components

Associated Observation Visit Parking Lot Item(s): 4

Description: During the November 2005 observation visit, Duke Power presented their NFPA 805, Chapter 4, methodology for transition. Included in this presentation was a discussion of the treatment of high-low pressure interface components. Duke Power's presentation identified that there are some differences in how high-low pressure interfaces are defined between NFPA 805 and NEI 00-01. NEI 00-01 is the circuit analysis methodology referenced in NEI 04-02. NFPA 805 establishes the requirements by reference in 10 CFR 50.48(c), and the guidance must be consistent with the standard.

Resolution Action(s)/Action Party: OPEN. Pending approval of FAQ. NEI will revise NEI 04-02 as necessary to clarify that the guidance in NEI 00-01 is consistent with the definitions in NFPA 805 and meets the requirements.

Associated FAQ: FAQ 06-0006

Lesson Learned: By reference in 10 CFR 50.48(c), NFPA 805 establishes the requirements of the rule and supersedes any implementation guidance.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 5**

Topic: Fire PSA Peer Review

Associated Observation Visit Parking Lot Item(s): 5, 20

Description: During the November 2005 observation visit, Oconee's fire PSA effort was identified as their critical path. The current schedule for completion of the PSA and submittal of the license amendment for adopting 10 CFR 50.48(c) and NFPA 805 would not support completion of an industry-developed fire PSA Peer Review prior to submittal. The Staff endorsed a position that a fire PSA Peer Review is part of the license amendment request to transition to NFPA 805.

While an ANS Fire PSA Standard is under development, and state-of-the-art guidance on performing fire PSA exists via NUREG/CR-6850 (EPRI TR-1011989), fire PSA remains (and will remain) in a state of development, rendering a "final" baseline against which to measure quality difficult. A peer review process analogous to that performed for internal event PSAs is under development by NEI and the Owners Groups to coincide roughly with the issuance of the fire PSA standard. However, it is unlikely that the Standard and the NEI peer review process will be completed and endorsed on a schedule that will fully support pilot-plant transition. Relief may come with the extension of enforcement discretion and Oconee may extend their pilot program for another year.

Discussion of this issue indicated that NRC oversight of the pilot-plant PSA effort would provide confidence in the quality of the PSA as part of the transition program. The pilot plants requested that the NRC perform intermediate PSA audits as the various elements of their fire PSAs are completed, rather than waiting to do a single audit during the license amendment review, to provide assurance that they are heading along the right path and provide lessons learned for non-pilot plants. The NRC agreed to accomplish this through several visits focused specifically on the fire PSA and a roll-up of these audits will substitute for an endorsed, industry-developed Fire PSA Peer Review for the pilot plants.

Resolution Action(s)/Action Party: OPEN. The NRC incorporated peer review guidance in RG 1.205, Section 4.3, was a discussion point at the March 2006 observation visit. The Regulatory Guide states that licensees should subject their fire PRA to a peer review to the extent that adequate industry guidance is available to support the transition process. Absent of industry guidance, the NRC will review the quality of the PRA for acceptability.

During the March 2006 observation visit, the NRC staff was asked to identify any specific needs they may have to perform the PRA Peer Review and what documentation will be necessary or provided that will constitute the record of this review and the acceptability of the PRA.

Associated FAQ: None.

Lesson Learned: The NRC Staff will assess the quality of the pilot-plant's fire PRA during the pilot in-process review of the PRA development. Until current efforts to establish fire PRA peer review standards and processes are completed, non-pilot plants transitioning to NFPA 805 may choose to have their fire PRA reviewed by an independent group against available guidance to minimize impacts to transition schedules and reduce uncertainty in fire PRA application

acceptability (e.g., in change analysis). As experience is gained with the pilot-plant reviews, additional lessons learned information would be provided.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 6**

Topic: PSA and change evaluations for Low-Power/Shutdown (LP/SD) modes

Associated Observation Visit Parking Lot Item(s): 6, 22

Description: During the November 2005 pilot-plant observation visit, industry representatives indicated that any requirement for a LP/SD mode fire PSA would be a cost prohibitive. There are no current guidance/methods for performing a LP/SD fire PSA. Although LP/SD fire PSAs exist, development of a standard is in progress and NRC/EPRI are considering a joint effort to develop guidance for shutdown fire PSA. Resources are not likely to be committed by utility management and the development of methods and performance of a LP/SD fire PSA would not support the transition schedules.

The NRC provided specific examples of LP/SD “risk” assessments under RG 1.174 plant change applications for licensees to consider in their NFPA 805 evaluations. The guidance in NEI 04-02 addresses LP/SD risk via the defense-in-depth approach currently used for outage management. This approach relies on the identification of high-risk evolutions and key safety functions associated with those evolutions (See NEI 04-02, Rev. 1, Section 4.3.3). The meeting attendees suggested that implementing guidance for meeting 10 CFR 50.48(c) should explicitly indicate the NRC’s expectations for assessing fire risk in LP/SD modes.

The change evaluation process must address risk for changes that affect LP/SD modes. However, NEI implementation guidance (NEI 04-02) currently does not address the method to use in performing change evaluations for these operational modes.

Resolution Action(s)/Action Party: OPEN. In RG 1.205, the NRC Staff accepted the approach described in NEI 04-02, Revision 1, for managing risk of LP/SD modes of operation. NEI will revise NEI 04-02 to address the performance of plant change evaluations for non-power modes.

Associated FAQ: Planned but not submitted.

Lesson Learned: At this time, a separate LP/SD fire PSA is not required, because there are currently no standards, methods or guidance available. Until these LP/SD fire PSA methods are developed and accepted, manage the fire risks during LP/SD modes according to established methods for outage risk management. Plants should identify high-risk evolutions and key safety functions and evaluate the associated structures, systems, and components as described in the endorsed NEI 04-02.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 7**

Topic: NFPA 805 Chapter 3 - Chapter 4 related requirements

Associated Observation Visit Parking Lot Item(s): 7, 8, 9

Description: During pilot-plant efforts to transition NFPA 805 Chapter 3 requirements and further develop and implement the guidance for plant change evaluations, the pilot plants identified concerns relative to the dependence of Chapter 3 fire protection design features on Chapter 4 required systems. Specifically, Chapter 3 requirements for detection, suppression, and fire barriers are dependent on these fire protection elements required by Chapter 4. During the November 2005 observation visit, the attendees determined that there was some confusion over the application of these requirements, particularly when applying a performance-based approach. In addition, because of the dependence of Chapter 3 on the requirements of Chapter 4, the change evaluation process should establish the Chapter 4 required systems before evaluating those systems against the Chapter 3 requirements.

Resolution Action(s)/Action Party: OPEN. Pending approval of FAQs. NEI needs to revise NEI 04-02 to clarify the application of these requirements. NEI has submitted a proposed revision and NRC Staff are reviewing the FAQs.

Associated FAQ: FAQ 06-0002 and 06-0004

Lesson Learned: Before doing Chapter 3 code compliance, determine which fire protection systems and elements Chapter 4 requires.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 8**

Topic: Performance-based alternative for fire area boundary evaluation

Associated Observation Visit Parking Lot Item(s): 10

Description: NFPA 805 includes provision for using existing engineering equivalency evaluations (i.e., GL 86-10 evaluations), but does not contain similar requirements for evaluation of fire protection features (e.g., fire barriers) using a risk-informed, performance-based approach. NFPA 805, Section 1.7, describes the general requirement for demonstrating equivalency in meeting the requirements of the standard. Section 1.7 states that the Authority Having Jurisdiction (i.e., the NRC) must approve alternative approaches. The rule (10 CFR 50.48(c)(2)(vii)) requires NRC approval of performance-based approaches to demonstrating compliance with NFPA 805, Chapter 3 requirements.

The Pilot Plants identified a need to revise NEI 04-02 to provide additional methodologies for performing engineering equivalency analyses that licensees could reference in their license amendment request.

Resolution Action(s)/Action Party: OPEN. Pending approval of FAQ. NEI developed proposed changes to NEI 04-02 to include a methodology and process for performing engineering equivalency evaluations. NEI Submitted a FAQ containing the proposed changes for NRC review.

Associated FAQ: FAQ 06-0008

Lesson Learned: Risk-informed, performance-based applications to fire protection under NFPA 805 needs a methodology for performing engineering equivalency evaluations, similar to current GL 86-10 evaluations.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 9**

Topic: Plant change evaluations - Preliminary risk screening

Associated Observation Visit Parking Lot Item(s): 11

Description: NEI 04-02, Revision 1, Section 5.3.3, Appendix I, and Appendix J address the use of preliminary screening with regard to evaluation of changes to the fire protection program. The attendees at the November 2005 observation visit held considerable discussion regarding the criteria to apply in the preliminary screening process and the need for additional guidance and examples in NEI 04-02.

Early in the development of NEI 04-02, NEI advocated a “qualitative” approach by which plant changes, which clearly would not influence risk, could be dispositioned without any quantification. Ultimately, the ACRS resisted this approach and therefore, all plant change processes would at least have a preliminary risk screen with some minimal level of quantification. Essentially a “qualitative” approach whereby changes that clearly did not increase risk, or did so at some to a “negligible” level, need not undergo any formal risk evaluation beyond a statement as to why any effect could be dismissed. Appendix I of NEI 04-02 listed some examples of these types of plant changes and Progress Energy provided example evaluations at the first observation visit.

Resolution Action(s)/Action Party: CLOSED. NRC and industry agreed that this would be a “living” part of NEI 04-02, whereby subsequent versions of NEI 04-02, for illustrative purposes, could include additional examples encountered in the transition process.

Associated FAQ: None submitted.

Lesson Learned: NEI will supplement the NEI 04-02 plant change evaluation process with examples identified during the pilot-plant transition.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 10**

Topic: Plant change evaluations - Preliminary screening criteria and form corrections.

Associated Observation Visit Parking Lot Item(s): 12

Description: While NEI originally proposed that the RG 1.174 thresholds be applied for determining “acceptable” increases in risk (measured via CDF and LERF) for NFPA 805 “self approvals” by licensees (i.e., without prior NRC review), the fact that RG 1.174 was conditioned on NRC review made adoption of equivalent thresholds untenable. Eventually, thresholds as outlined in RG 1.205, NRC included a “grey area” where the NRC review would be at NRC’s discretion.

NEI 04-02, Appendix I, contains the plant change evaluation form. Section 4 of this form addresses the preliminary risk screening and includes qualitative criteria. Discussion during the November 2005 observation visit concluded that “greater than minimal” criteria should be revised to “potentially greater than minimal” when determining if more quantitative risk analysis is needed for the change. RG 1.205, Section 3.2.5, provides additional guidance with regard to risk thresholds to apply in the plant change evaluation process, and clarifies the terminology, such as “minimal,” used in NEI 04-02, in determining the acceptability of the change and the need for NRC approval.

Resolution Action(s)/Action Party: OPEN. Pending approval of FAQs. NEI 04-02, Sections 5.3 and Appendix I will be revised to provide additional guidance on performance of preliminary screening and correct the change evaluation form with regard to applying the “potentially greater than minimal” criteria.

Associated FAQ: FAQ 06-0003

Lesson Learned: Pending final resolution of FAQ

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 11**

Topic: Plant change evaluation - PSA engineer reviews of screens

Associated Observation Visit Parking Lot Item(s): 13

Description: During the November 2005 observation visit, the Pilot Plants held considerable discussion regarding whether or not a PRA engineer should review the preliminary risk screening performed for plant changes. This topic is similar with some of the previous discussions regarding “qualitative” risk screening and involves the level of licensee review, if any, by the licensee PRA staff. The NRC advocates that the plant PRA staff see all plant changes, such that even the most trivial could be a simple sentence in the record. Licensees favored screening by fire protection personnel for such trivial items (using guidance developed with input from the plant PSA staff, perhaps in the form of screening questions), such that no PSA staff notification would be required.

In follow-up discussions of this topic during the March 2006 observation visit, it was determined that the interface between the PSA staff and fire protection program change evaluation screening process is plant specific and did not warrant tracking as a parking lot issue.

Resolution Action(s)/Action Party: CLOSED. No action taken.

Associated FAQ: None.

Lesson Learned: The interface between the PSA and fire protection staff during the fire protection program screening process for plant change evaluations is plant-specific, but it should ensure that all necessary communication between these respective disciplines occurs as part of the screening process.

NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 12

Topic: Authority having jurisdiction (AHJ) - NFPA Code deviations

Associated Observation Visit Parking Lot Item(s): 14

Description: The NRC is the Authority Having Jurisdiction (AHJ) for determining acceptability of fire protection program elements to meet the requirements of NFPA 805. 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 1.8 addresses “Code of Record,” which allows licensees to meet the version of the standard applicable to the fire protection element or design feature at the time it was designed or otherwise committed to the AHJ. Plants should follow the approval authorities granted by the code-of-record, with the recognition that the AHJ is the NRC as described in RG 1.205, Regulatory Position C.1.

Resolution Action(s)/Action Party: CLOSED. RS 1.205 incorporates the NRC position on AHJ. Parking Lot Item 10 (See Issue Summary Sheet No. 8 above) involves development of a process similar to the existing engineering equivalency evaluation (NFPA 805, Section 2.2.7 and GL 86-10) and is currently under review as an FAQ.

Associated FAQ: None.

Lesson Learned: NRC is the AHJ as described in RG 1.205, but the code-of-record for a given plant fire protection feature may allow licensees certain authority to establish applicable requirements that may differ (i.e., equivalency evaluations) from the versions cited in NFPA 805.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 13**

Topic: Transition baseline risk.

Associated Observation Visit Parking Lot Item(s): 19, 24

Description: The Pilot Plants discuss an issue regarding the cumulative impact of changes to the fire protection program that occur during the transition process. The new baseline risk established at the completion of implementation should incorporate these impacts. From the November 2005 observation visit, this issue is a spin-off of an industry concern with how and to what extent the difference between the “going forward” and “deterministically fully compliant” risks will be evaluated for transition. This issue is somewhat related to Topics 2 and 24. Based on the recent NRC clarifications with respect to vital fire protection program elements, especially circuit spurious operations (“any and all, one at a time”) and operator manual actions for redundant trains in the same fire area (Appendix R, III.G.2), industry is concerned as to what would serve as the “deterministically fully compliant” baseline risk against which to measure the increase “going forward.”

While calculating the “going forward” fire risk is relatively straightforward, doing likewise for the “deterministically fully compliant” risk could require essentially a second full fire PSA for “ideal” conditions. NRC proposed a multi-step analytic approach whereby the licensees could proceed from the most to least conservative (least to most realistic) estimate of the risk increase due to the transition, with the ability to stop the analysis at whatever step provides an estimate of an acceptable risk increase.

Resolution Action(s)/Action Party: OPEN. Pending approval of FAQs. RG 1.205, Section C.3.2.6, provides the staff position on treatment of individual and cumulative changes in risk, as well as the use of risk reductions associated with unrelated plant changes to offset increases in fire protection risks. NEI 04-02 will be updated to clarify that the baseline fire protection program risk, post-transition, will be the risk of the plant as designed and operated according to the NRC-approved licensing basis. This position is RG 1.205 and NEI will revise NEI 04-02 to address screening, processing and tracking of changes.

Associated FAQ: FAQ 06-0005 & FAQ 06-0014.

Lesson Learned: Pending submittal and final resolution of FAQ. Transitioning plants must establish baseline fire protection risk to support plant change evaluations post-transition.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 14**

Topic: Regulatory position on interim guidance changes

Associated Observation Visit Parking Lot Item(s): 16

Description: RG 1.205 endorses NEI 04-02, Revision 1. The pilot-plant implementation activities and observation visits have identified a number of changes that are necessary to clarify, update, or revise the implementing guidance in NEI 04-02. As pilot-plant implementation progresses, it is expected that the need to make these types of changes will continue. The processes for revising and reissuing these documents are neither 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.

At the March 2006 pilot-plant observation visit, the industry proposed a Frequently Asked Question (FAQ) process as a means to address this issue. The Maintenance performance indicators process FAQs is the baseline for the NFPA 805 process. The NRC Staff agreed this may be a viable approach, but suggested that the utilities formally submit their requests by letter to initiate the FAQ process.

Resolution Action(s)/Action Party: CLOSED. By letter dated May 2, 2006, NEI submitted a letter with a draft description of the FAQ process for NRC review. The NRC responded with proposed changes in a letter to NEI dated July 12, 2006.

Associated FAQ: None. See referenced letters.

Lesson Learned: The NRC established a FAQ process to provide timely NRC review of changes to NFPA 805 implementing guidance. NEI will be incorporate approves FAQs in revisions to NEI 04-02. The NRC will revise RG 1.205, as appropriate; to endorse this revised NEI guidance.

NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 15

Topic: Circuit analysis Generic Letter and RIS - Compliance issues for transition

Associated Observation Visit Parking Lot Item(s): 17

Description: This issue has significant implications related to implementation of NFPA 805. Specifically, the circuit analysis RIS and draft Generic Letter require a level of compliance for deterministic circuit analysis (associated with current fire protection programs) that is not currently achieved by most plants. A comparison between the NFPA 805 risk analyses against the deterministic case is required (NFPA 805, Section 4.2.4.2). Licensees 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.

The NRC staff presented a suggested process by which licensees could establish an “ideal” risk baseline for the compliant deterministic case.

Resolution Action(s)/Action Party: CLOSED. This issue is related to others issues establishing the PRA baseline for the performance of plant change evaluation (See Issue Summary Sheets 13 and 18).

Associated FAQ: None planned.

Lesson Learned: None. Other parking lot issue and associated lessons learned will address this issue.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 16**

Topic: NEI 04-02, Appendix B, methodology changes

Associated Observation Visit Parking Lot Item(s): 18

Description: Pilot-plant transition activities at the Oconee Nuclear Station have determined that the comparison tables of NEI 04-02, Appendix B, do not adequately communicate the compliance status and transition of current fire protection program elements to the nuclear safety performance criteria of NFPA 805. The pilot-plants and NEI will incorporate in NEI 04-02 an alternative methodology. The NRC staff expressed concern that NEI should communicate these types of issues with the existing (endorsed) guidance to non-pilot plants.

Resolution Action(s)/Action Party: OPEN. Pending approval of FAQ. NEI to develop alternative methods to comparison tables in NEI 04-02, Appendix B.

Associated FAQ: FAQ 06-0013

Lesson Learned: Transition activities for ONS identified that the current tabular method for transition of nuclear safety performance criteria, as described in NEI 04-02, Appendix B, is not an effective means of communicating the necessary information to demonstrate compliance with NFPA 805.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 17**

Topic: Risk acceptance thresholds.

Associated Observation Visit Parking Lot Item(s): 21

Description: There is a number of “risk acceptance” thresholds for fire PSA-related applications among various documents and programs, specifically the Reactor Oversight Process (ROP), the Significance Determination Process (SDP), RG 1.174 (and, by incorporation, NFPA 805), NEI 04-02 and RG 1.205. The Pilot Plants need to develop a reconciliation of these various thresholds for clarity and application of transition processes.

Resolution Action(s)/Action Party: OPEN. Guidance is required before performance of change evaluations.

Associated FAQ: Planned but not submitted.

Lesson Learned: Pending final resolution of the issue.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 18**

Topic: Definition for fire protection program change

Associated Observation Visit Parking Lot Item(s): 23

Description: During the March 2006 observation visit, the Pilot Plants held a discussion regarding what constitutes a change to the fire protection program. The attendees noted that plant changes not related to the fire protection program might influence the program. Installation of some fire protection systems and features are for protective purposes not related to demonstrating compliance with NFPA 805. Are these systems and features within the scope of the fire protection program that is subject to evaluation under the NFPA 805-required plant evaluation change process? The discussion identified a need to better define the boundaries of the fire protection program for the purposes of configuration control and application of the change evaluation process.

Resolution Action(s)/Action Party: OPEN. Pending resolution of FAQ. Industry drafted a methodology and examples of what constitutes a fire protection program change.

Associated FAQ: FAQ 06-0005.

Lesson Learned: Pending final resolution of this issue.

NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 19

Topic: Tracking of Cumulative Risk from Post-Transition Plant Changes

Associated Observation Visit Parking Lot Item(s): 15, 24

Description: At the March 2006 observation visit, three specific items discussed were relevant to this topic:

Is a license amendment request needed post-transition to credit existing Systems, Structures, and Components (SSCs) to lower fire risk, i.e., taking credit for these not as offsets to risk increases but purely as decreases;

If both risk increases and decreases are due to related changes, such that the net increase is <10 E-7/yr delta-CDF (<10 E-8/yr delta-LERF), the changes need not be submitted for prior NRC approval. However, if they are unrelated (e.g., one is part of the fire protection program while the other is not), then prior NRC approval is needed; and

If an initial change results in a risk increase below some threshold value, the licensee needs to track future changes or be exempt from future tracking. What would be the appropriate threshold value, as determined through a screening process? Clarification is needed in the implementing guidance (i.e., Regulatory Guide or NEI 04-02) as to whether the tracking of the impacts of these changes needs to be continued post-transition or whether tracking of cumulative impacts begins when the new baseline risk is established.

RG 1.205 uses RG 1.174 as a risk acceptance template and requires that cumulative increases in risk be tracked over time and that increases in risk attributable to "related" program changes be aggregated to determine their total impact even if separated over time. Both of these imply that, no matter how widely separated in time these increases may be, they need to be summed and measured against the original baseline, i.e., the initial "going forward" fire risk, even if a fire PSA re-baselining is periodically performed. NRC distributed a graphic to illustrate the difference between the RG 1.174 approach and another where the "going forward" fire risk is "reset" after each periodic update (essentially shifting the time axis). The latter, although somewhat simpler, is not consistent with RG 1.174. However, except for related changes, tracking of the cumulative risk increase can be accomplished by considering the total risk rather than by segregating the changes into separate entities requiring individual aggregation. However, separate tracking for "related" changes over the life of the plant is a requirement. The Pilot Plants discussed screening methods to simplify this latter process, whereby risk increases of sufficiently low magnitude could be considered too small to merit retention for future tracking as part of a series of "related" changes (they would still be tracked implicitly through the total plant risk).

Resolution Action(s)/Action Party: OPEN. Pending resolution of FAQ. RG 1.205, Section C.3.2.6, provides the staff position on treatment of individual and cumulative changes in risk, as well as the use of risk reductions associated with unrelated plant changes to offset increases in fire protection risks. As stated in RG 1.205, NEI will revise NEI 04-02 to clarify that the baseline fire protection program risk, post-transition, will be the risk of the plant as designed and operated according to the NRC-approved licensing basis. NEI will also revise NEI 04-02 to address the screening, processing, and tracking of changes.

Associated FAQ: FAQ 06-0014.

Lesson Learned: Pending submittal and final resolution of FAQ. Licensees must establish baseline fire protection risk to support plant change evaluations post-transition.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 20**

Topic: Fire Zones/Compartment Definitions

Associated Observation Visit Parking Lot Item(s): 25

Description: During the October 2006 visit, Pilot Plants held discussion regarding what constitutes an acceptable Fire PSA compartment. For the purposes of fire PRA, plants portioning divides the plant into the Fire Compartments as defined in NUREG/CR-6850. Fire Compartments map fire areas and zones into compartments defined by fire damage potential. Defining many Fire Compartments within zones are that are not necessarily based on physical barriers or features can lead to the need to do substantial multi-compartment analysis. This is inconsistent with the guidance provided in NUREG/CR-6850 and raises concerns with the difficulty in managing and reviewing an analysis that relies on such complexities. Questions arose over impact of this approach on other tasks and level of documentation needed to justify this approach

Resolution Action(s)/Action Party: OPEN. Industry will provide clarification on the methodology.

Associated FAQ: Planned but not submitted.

Lesson Learned: Pending final resolution of this issue.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 21**

Topic: Ignition Frequency Binning Issues

Associated Observation Visit Parking Lot Item(s): 26, 27, 28, 29

Description: NUREG/CR-6850 Task 6, "Fire Ignition Frequencies" provides a procedure for estimating fire-ignition frequencies for use in the Fire PSA. During the October 2006 observation visit, the pilot plants held presentations regarding the definitions and boundaries associated with "binning" of different components into appropriate collections to appropriate the fire ignition frequencies correctly compartment. Specifically questions arose concerning:

- a) Main control board definition: The delineation between Bin 4 (main control board) and Bin 15 (electrical panels/cabinets) has some ambiguity that could lead to inconsistent application of the guidance (Parking Lot Item 26).
- b) Electrical cabinets: NUREG/CR-6950 needs explicit guidance on counting of plant electrical cabinets. Presentations on two different approaches; one that counts electrical cabinet based on physical boundaries regardless of size or length and another that counts solely based on cabinet size (Parking Lot Issue 27).
- c) HEAF frequency for low voltage equipment: Counting Bin 16 equipment using the Bin 15 method can result in a fire frequency distribution for HEAF for switchgears and load centers that are inconsistent with industry experience (Parking Lot Item 28).
- d) Miscellaneous Binning Issues: Questions arose concerning ignition county frequency for MOV motors, hydraulic actuators for valves, and transformers (Parking Lot Item 29).

Resolution Action(s)/Action Party: OPEN. Industry will provide clarification on the methodology.

Associated FAQ: Multiple FAQs planned but not submitted.

Lesson Learned: Pending final resolution of this issue.

**NFPA 805 Pilot-Plant Implementation
Issue Summary Sheet No. 22**

Topic: Transition and Post-Transition Program Management

Associated Observation Visit Parking Lot Item(s): 30

Description: During the October 2006 visit, discussion was held regarding the role of 10 CFR 50.48(a) for a plant this is transitioning to NFPA 805.

Resolution Action(s)/Action Party: OPEN. Industry will provide clarification on the issue.

Associated FAQ: None planned.

Lesson Learned: Pending final resolution of this issue.