

May 28, 2009

MEMORANDUM TO: Mark A. Cunningham, Director
Division of Risk Assessment
Office of Nuclear Reactor Regulation

FROM: Paul Lain, Senior Fire Protection Engineer **/RA/**
Fire Protection Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

Steven A. Laur, Senior Technical Advisor **/RA/**
Division of Risk Assessment
Office of Nuclear Reactor Regulation

SUBJECT: LESSONS FROM REGULATORY AUDITS OF THE PILOT PLANTS
THAT ARE TRANSITIONING TO A FIRE PROTECTION LICENSING
BASIS BASED ON THE NATIONAL FIRE PROTECTION
ASSOCIATION (NFPA) STANDARD NFPA 805 AS ALLOWED BY
10 CFR 50.48(c) (TAC NO. MC5630)

The purpose of this memorandum is to capture insights gained in conducting regulatory audits of the two pilot plants that are transitioning their fire protection programs to a licensing basis that will be performance-based via the National Fire Protection Association (NFPA) standard NFPA 805 as allowed by 10 CFR 50.48(c). The memorandum should allow the lessons to be incorporated into future audits of licensing actions for similar NFPA 805 transitions. Some of the insights involve audit logistics and others involve technical or licensing issues. The insights are intended to provide information to aid both Nuclear Regulatory Commission (NRC) staff and licensees in having efficient and effective audit experiences. The information herein does not set or modify NRC regulatory positions or provide regulatory or technical guidance.

The NRC staff and contractors conducted regulatory audits of the two NFPA 805 pilot plants, Oconee Nuclear Station (Oconee) and Harris Nuclear Plant (Harris), using the guidance of Office of Nuclear Reactor Regulation (NRR) office instruction LIC-111, "Regulatory Audits" (Agencywide Document Access and Management System (ADAMS) Accession No. ML082900195). The Oconee audit was conducted the week of February 23, 2009, and the Harris audit the week of March 16, 2009. The audit plans for both of these are publicly available in ADAMS: Oconee – ML090290196; Harris – ML090290327. The audit team members, licensee personnel with whom the team interfaced, and the documents reviewed may be found in ADAMS as well: Oconee – ML090900390; Harris – ML090990504.

CONTACTS: Paul W. Lain, DRA/NRR
(301) 415-2346
Steven A. Laur, DRA/NRR
(301) 415-2889

The purpose of the audits was to gain an understanding of the information provided in each license amendment request (LAR) to determine whether additional information would be required to support the NRC staff's licensing decision. This included reviewing supporting documentation provided by the licensee during the audit, which may have included identification of material from these documents that the NRC staff believes should accompany the LARs, either directly or through responses to the requests for additional information (RAIs). In this way, any staff RAIs should be of focused scope and of high quality.

Insights for NRC Regulatory Audit Teams

Several aspects of the regulatory audits were favorable and should be continued in future audits:

- A relatively detailed audit plan was prepared.
- Audit team kick-off meetings were held.
- Several pre-audit planning meetings were conducted.
- Entrance meeting slides were prepared at NRC headquarters and distributed to key team members.
- The role of observers was discussed with them before arriving on site. The observers did not adversely impact conduct of the audit; and, in some circumstances, proved beneficial in identifying issues that became of concern to the reviewers, especially related to the fire probabilistic risk assessment (PRA).
- A list of requested presentation topics was provided to the licensee before the audit.
- Audit team members had access to all licensee submittal information.
- Daily audit team roll-up meetings were effective in developing issues and determining information requests to be made to the licensee. These were facilitated by an ad-hoc briefing template for the daily licensee debrief, which served to focus the team roll-up. (Team roll-up meetings were held each day; the licensee technical staff was briefed Tuesday, Wednesday, and Thursday; the exit meeting was held on Friday.)

There were aspects of the regulatory audits that should be improved upon:

- An audit should not be scheduled until a complete license amendment request has been received and accepted for review by NRC in accordance with NRR Office Instruction LIC-109, "Acceptance Review Procedures" (ML081200811).
- The audit plan should be sent to the licensee at least a month before the scheduled audit dates.
- The number of observers should be kept small; e.g., no more than three or four.
- Audit team members should have not only reviewed the submitted material, but ideally should have drafted safety evaluation input and potential RAIs before the audit plan is finalized.
- The audit plan should be tailored for a given licensee based on the license amendment request. For example, areas where sufficient information has been provided should be removed from the audit plan.
- Draft RAIs should be provided to the licensee prior to the audit to the extent permitted by NRR Office Instruction LIC-101, "License Amendment Review Procedures" (ML040060258). If the NRC staff has developed questions from reviewing the LAR and any supporting information that can be answered by the licensee during the site visit, these should be submitted to the licensee at least two weeks prior to the visit to enable

them to get a head start on providing answers or identifying appropriate sources of information for the reviewers.

- A lead reviewer for each audit focus area (e.g., safe shutdown, fire protection, fire PRA) should be identified. Requests to licensee personnel for information, documents, presentations, etcetera, should be made through the lead as practicable.

Insights for Licensees Implementing NFPA 805

The licensees provided excellent logistical support of their regulatory audits:

- The licensee provided ample conference room space.
- Computers and access to electronic documents and databases were made available.
- The individuals who performed the analyses were available to the audit team for discussions, presentations, and interviews. Consultants were available to support technical areas which they had developed.
- A database was used to track NRC audit team requests and ensure timely close-out.
- Scheduled topical discussions were beneficial.

In order to improve efficiency during an audit, the licensee should have available in the audit location documentation that will allow a reviewer to:

- identify particular scenarios of interests from all scenarios (e.g., lists of delta risk from retained non-compliances, list of delta risk from proposed modification);
- determine a particular ignition source associated with any selected scenario;
- determine how the ignition frequency for that source was developed;
- determine what suppression was applied and the credit given to that suppression;
- determine what equipment was failed by that source with and without suppression and with and without large/small fire designations as applied;
- determine how multi-compartment evaluation for that scenario was evaluated and what contribution from the multi-compartment (if any) is included; and,
- determine the characteristics of the scenario, e.g. the initiating event, the accident progression, the status of the vessel and containment at core melt, the contribution to core damage frequency (CDF) and large early release frequency (LERF).

Licensee should also have readily available:

- all documentation describing the internal event PRA and summarizing the results;
- all documentation describing the fire PRA and summarizing the results; and,
- all documentation related to the reviews of the PRA and the resolution of all comments.

There were several areas of confusion over what should be the scope, content, and focus of the NFPA 805 license amendment request. In some cases, the licensee and the NRC audit team interpreted the regulatory guidance differently. These issues are summarized below:

- In a number of cases, aspects of implementing NFPA 805 had not been developed or were in draft form. These included programs and procedures necessary for meeting the NFPA 805 requirements. The NRC audit team expected these aspects of NFPA 805 to be described in the LAR in sufficient detail to allow a reviewer to make a regulatory conclusion and to allow an inspector to determine whether the final program or procedure was consistent with what the reviewer had been provided.

- Plant modifications need to be developed to a sufficient level of detail that the reviewer can determine whether the intent of the modification relative to compliance with NFPA 805 requirements, including how it is modeled in the fire PRA, is acceptable. There must also be a clear identification of which modifications are to be implemented as part of the NFPA 805 transition (and therefore included in the fire PRA “going-forward” model), with the dates for completion of these modifications clearly indicated as commitments.
- The fire PRA must be constructed from an internal events PRA model that has been peer reviewed and updated to address the findings from that peer review.
- The PRA methods, including how the fire PRA is applied in the performance-based approach, must be described sufficiently for a reviewer to agree that they are appropriate and meet the regulation. Per Section 2.4.3.3 of NFPA 805, the PRA approach, methods, and data shall be acceptable to the NRC, and shall be appropriate for the nature and scope of the change being evaluated, be based on the as-built and as-operated and maintained plant, and reflect the operating experience at the plant.
- In some cases, a large quantity of information was presented in the LAR and the licensee requests NRC agreement that NFPA 805 has been met. It is incumbent upon the licensee to state that the requirements are met, and provide a basis. The NRC should not have to deduce or infer compliance; the licensee should provide a suitable summary and conclusion.
- The licensee must describe in detail its proposed process for self-approval of changes to the fire protection program after implementation of NFPA 805, including the methods that will be used to assess the risk. These methods should be specific in terms of the calculational means by which changes in risk (CDF and LERF) resulting from specific post-transition plant change evaluations will be performed.
- The licensee must provide the additional risk (compared to NFPA 805 Chapter 4 deterministic criteria) of any operator actions meeting the NFPA 805 definition of “recovery action.” Licensee should ensure that recovery actions are properly identified and consistent with the definition.

The NRC staff recognizes that Harris and Oconee are pilot plants. The NRC staff plans to use the observations with respect to scope, content, and focus of the LARs to inform revisions to regulatory guidance (e.g., Regulatory Guide 1.205; Standard Review Plan Section 9.5).

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