



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 8, 2010

Mr. Dave Baxter
Vice President, Oconee Site
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST
TRANSITION TO TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*,
SECTION 50.48(c), NATIONAL FIRE PROTECTION ASSOCIATION STANDARD
NFPA 805 (TAC NOS. MD8822, MD8823, AND MD8824)

Dear Mr. Baxter:

By letter dated May 30, 2008, as supplemented October 31, 2008, January 30, 2009, February 9, 2009, February 23, 2009, May 31, 2009, August 3, 2009, September 29, 2009, and November 30, 2009, Duke Energy Carolinas, LLC, submitted a license amendment request (LAR) to transition the fire protection licensing basis at Oconee Nuclear Station, Units 1, 2, and 3 from Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.48(b) to 10 CFR 50.48(c), *National Fire Protection Association Standard (NFPA) 805*.

To complete our review of the LAR, the U.S. Nuclear Regulatory Commission (NRC) staff needs additional information. The NRC staff's request for additional information (RAI) is enclosed. On February 24, 2010, your staff stated that the response to all of the RAIs would be provided by in the April 15, 2010, supplement to the LAR.

If you have any questions, please call me at 301-415-1345.

Sincerely,

A handwritten signature in black ink that reads "John Stang".

John Stang, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosure:
RAI

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION (RAI)

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

TRANSITION TO TITLE 10 OF THE CODE OF FEDERAL REGULATIONS, SECTION 50.48(c),

NATIONAL FIRE PROTECTION ASSOCIATION STANDARD (NFPA) 805

By letter dated May 30, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML081650476), as supplemented by letters dated October 31, 2008 (ADAMS Accession No. ML083120362), January 30, 2009 (ADAMS Accession No. ML091040205), February 9, 2009 (ADAMS Accession No. ML090480143), February 23, 2009 (ADAMS Accession No. ML090700134), May 31, 2009 (ADAMS Accession No. ML091590045), August 3, 2009 (ADAMS Accession No. ML092190212), September 29, 2009 (ADAMS Accession No. ML092740624) and November 30, 2009 (ADAMS Accession No. ML093410007), Duke Energy Carolinas, LLC (the licensee), submitted a license amendment request (LAR) for the U.S. Nuclear Regulatory Commission (NRC) staff's review and approval. The proposed LAR would approve the transition of the fire protection licensing basis at Oconee Nuclear Station, Units 1, 2, and 3 (ONS) from Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.48(b) to 10 CFR 50.48(c), *NFPA 805*.

The NRC staff has determined that the following information is needed in order to complete its review of the LAR.

RAI 1-2.1

Table 1-2-1 provided in the response to RAI 1-2 identifies the types of changes and methods that ONS intends to use to make future plant changes without NRC approval. Regulatory Position 3.1 of Regulatory Guide (RG) 1.205, Rev. 1, identifies the following as acceptable methods to assess the risk of a change that may be made without NRC approval: "methods that have been used in the peer-reviewed fire Probabilistic Risk Analysis (PRA) model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact." Clarify which of the NRC acceptable methods apply to each of the changes and methods identified in Table 1-2-1.

RAI 1-7

The proposed license condition in Attachment M of the LAR deviates from the sample license condition in RG 1.205, Rev. 1, in that a Safety Evaluation (SE) dated April 28, 1983, approving the Safe Shutdown Facility (SSF) design will be carried forward with the NFPA 805 fire protection program (FPP). Clarify why the April 28, 1983, SE is carried forward. In the response, identify the specific fire protection-related elements of this SE that are being carried forward and provide justification for why these are not included as previously approved alternatives to the NFPA 805 requirements. Furthermore, the April 28, 1983, SE is included in LAR Attachment K, Licensing Action Review, and LAR Section 4.2.2.2 indicates that the existing licensing actions included in Attachment K are to be superseded by the NRC-approved NFPA 805 FPP. Clarify this apparent discrepancy with the proposed license condition.

Enclosure

RAI 1-8

Section 5.4, "Revisions to the ONS Updated Final Safety Analysis Report (UFSAR), of the LAR and Attachment R, "UFSAR Changes" of the LAR are regarding changes that ONS is proposing to make to the UFSAR. The licensee states in the Transition Report (TR) that the changes to be made to the UFSAR as described in the LAR, are "an example of the content and level of detail of the proposed changes" and that the final changes to the UFSAR will be submitted to the NRC in accordance with the requirements of 10 CFR 50.71(e) after NRC approval of the LAR. The LAR transmittal letter provides ONS's commitment to make this submission:

"A discussion of the changes to Updated Final Safety Analysis Report (UFSAR) necessitated by the license amendment and a statement that the changes will be made in accordance with 10 CFR 50.71(e)."

Provide the "anticipated" changes to the UFSAR reflecting the NFPA 805 FPP. The "example" changes to the UFSAR FPP do not describe the FPP quality assurance program. Provide justification for why the FPP Quality Assurance Program is not included in the UFSAR.

RAI 1-10

Section 5.5 of the LAR provides a transition implementation schedule of 18 months after NRC issuance of the SE. Provide justification for the 18-month transition implementation schedule.

RAI 2-4.1

The response to RAI 2-4 identifies the NFPA 805 codes, and associated NFPA 805 sections, that ONS is evaluating compliance against. Clarify whether the cited NFPA codes become the Codes of Record for the relevant ONS fire protection systems and features.

RAI 3-2.1

The response to RAI 3-2 states that the 10-minute delay following confirmation of an active fire was not credited in the ONS analysis (Fire PRA). Clarify whether components that spuriously operated in the Fire PRA were assumed to be recovered.

RAI 3-3.1

The response to RAI 3-3 provides a schedule for completion of Phase I and Phase II of the breaker coordination study. Provide an update of the results of these two phases. Specifically discuss any findings and actions ONS is taking to resolve these findings.

RAI 3-18.1

The response to RAI 3-18 generally describes a revised process that ONS is using to identify what actions are success-path recovery actions and estimate the additional risk of these recovery actions. Provide a description of the process that ONS has used in sufficient detail to support a NRC staff review, and the results of the evaluation.

RAI 3-29.1

The response to RAI 3-29 does not provide the information requested, which is to provide documentation that (a) demonstrates that the scope of the review performed was adequate to address NFPA 805 nuclear safety capability concerns during all modes of plant operation, (b) identifies any deficiencies identified during the review, and (c) describes how the identified deficiencies have been resolved. The RAI response indicated the ONS breaker coordination study includes a review of cable sizing to support a common enclosure validation. The response to RAI 3-3 provided a schedule for completion of Phase I and Phase II of the breaker coordination study. Similar to RAI 3-3.1, provide an update of the results of these two phases. Specifically discuss any findings and actions ONS is taking to resolve these findings.

RAI 4-1.1

The response to RAI 4-1 did not provide the requested information and neither the information provided in the response or provided in the LAR meet the requirement of NFPA 805 to demonstrate by fire area that the radiological release performance criteria have been met (see NFPA 805 Sections 1.5.2 and 2.2.4). Since the requested information is not available on a fire area basis, provide the following:

- Identify the ONS fire pre-plans (including revision numbers), identify and briefly describe the fire zones addressed by each fire pre-plan, and correlate the fire zones to the fire areas. In the response, clearly describe any outlying buildings reviewed (e.g., 8027, 8055, 8087, 8089, 8091, 8093, and 8096).
- For each fire pre-plan, identify the engineered systems (e.g., curbs, monitored drains, HEPA-filtered forced ventilation, etc.), and monitoring and control methods, relied upon to control contaminated suppression agent runoff and contaminated combustion products. The response should also clarify how releases are controlled for any outside yard areas that may have radioactive materials areas or other similar storage locations of potentially contaminated materials.
- Discuss provisions for containment and monitoring of contaminated agent runoff and contaminated combustion products should the effectiveness of installed engineering controls be challenged or impacted by fire suppression activities.
- Discuss how fire brigade training materials have been updated to address the NFPA 805 radioactive release objectives and performance criteria.
- Describe how the radioactive release reviews will be maintained post-transition. Clarify if there is any difference in brigade response, monitoring and control methods, and engineered systems relied upon in fire areas RB1, RB2, and RB3 during operation and during non-power operation with the equipment hatch open.

- Provide justification for carrying forward the 10 CFR Part 20 exemption for liquid effluents into the NFPA 805 FPP. In the response, provide a reference to both the ONS exemption request and the NRC SE, provide justification for its applicability to the NFPA 805 FPP, and provide an assessment of its continued validity.

RAI 5-19.1

The response to RAI 5-19 and RAI 5-20 confirmed those substantive changes to proposed plant modifications have been made between the October 2008 and the May 2009 submittal. The response to RAI 5-15 indicated that the change in risk estimates have also changed but “not enough to impact” the RG 1.174 acceptance guidelines. The response to RAI 5-20 identified further changes to the proposed plant modifications described in the May 2009 submittal. The response to RAI 5-23 concluded that, “it is Duke’s position that the reduction in risk as a result of committed modifications more than compensates for the increase in risk associated with non-compliances.” Provide the requested information identifying what modifications will be implemented, what changes in risk are associated with these modifications, and what changes in risk are associated with the previous non-compliances.

RAI 5-20.1

The response to RAI 5-20 notes that any modifications arising from the IN 92-18 study are not expected to have any impact on risk since the Fire PRA does not credit the recovery of spurious valve actuations. The response also clarifies that the Fire PRA will be reviewed after the scope of the IN 92-18 resolutions is fully evaluated. Provide the schedule for completing the IN 92-18 study and assessing its impact on the Fire PRA.

RAI 5-22.1

In the response to RAI 5-22, the applicant clarified that there is no cable hit in Fire Area BH3 for either the Unit 1 or 2 main feeder busses or the standby bus in Fire Area BH12. ONS states that “If further analysis indicates BH12 components are impacted, then the CDF [core damage frequency] & LERF [large early release frequency] will increase.” Clarify the following: (1) the relationship between this modeling assumption and the change in risk estimates that will be compared to the acceptance guidelines, including an estimate of the change in risk parameters after this improvement and (2) any plans for further analysis of this issue and the ONS process for resolving this issue if impacts are identified.

RAI 5-23.1

The response to RAI 5-23 states “As a result of transition to NFPA 805, the overall risk at the plant level decreases and therefore meets the numerical acceptance guidelines of RG 1.174.” While this may be true, Regulatory Position 2.2.4.1 of RG 1.205, Rev. 1, states that the NRC staff will assess the acceptability of any increase in risk on a fire area basis. Clarify the ONS response with respect to Regulatory Position 2.2.4.1. In the response, specifically discuss how ONS has assured that the delta CDF and LERF for each fire area has satisfied Regulatory Position 2.2.4.1 and RG 1.174. In the response, specifically provide and discuss bounding estimates of any CDF or LERF increases.

RAI 5-33.1

In response to RAI 5-33, the guidance from Chapter 8 and Appendices H and S of NUREG/CR-6850 were cited as the basis for the "relaxation" of the damage criteria for solid-state electronics. Based on review of NUREG/CR-6850, the relaxation appears acceptable without a sensitivity analysis if, when considering the configuration where "the cabinet is beyond the ZOI [Zone of Influence] based on cable damage criteria but within the ZOI based on damage thresholds for sensitive electronics [a screening value of 3 kW/m²]," the "ZOI based on cable damage" was 6 kW/m², cited in NUREG/CR-6850 as the criterion for ignition of solid-state components, assuming the thermoplastic cable damage threshold. OSC-9375, "*Oconee Fire PRA Scenario Development*," does not specify the assumed ZOI for solid-state electronics, other than that it is based on cable damage criteria. However, OSC-9375 cites 11.4 kW/m² for thermoset cable damage, seeming to imply that this, rather than the 6 kW/m² thermoplastic threshold, was assumed for the solid-state electronic ZOI. Clarify which ZOI was used and, if the thermoset rather than the thermoplastic ZOI was used, provide justification and an estimate of the impact had the thermoplastic ZOI been assumed.

RAI 5-59.1

The response to RAI 5-59 directed the NRC staff to OSC-9518, NFPA 805 Fire Probabilistic Risk Assessment Application Calculation, for the requested series of LERF values and indicated that essentially no additional insights resulted from the LERF analysis with respect to those provided by the CDF analysis. The response to RAI 5-5 provides the LERF values for the top 10 fire LERF contributors. Provide the requested series of LERF values that parallel those reported in the LAR and in response to RAI 5-6 for CDF, including the top 90% of the fire LERF contributors.

RAI 5-69

Relative to the LAR B-3 Table, licensing actions identify previously approved exemptions being brought forward as the compliance method to NFPA 805. For Fire Area WP1, Appendix R exemption for expansion joints is being brought forward as the compliance strategy. The elements necessary to make that exemption acceptable are listed in the B-3 Table. They include smoke detection and manual suppression (extinguisher and hose stations) as part of the justification for acceptance. The B-3 Table also identifies that "The remaining bases for previous acceptance are still valid, as substantiated by field walkdown..."

However, in the statement of "suppression and detection required" in the same table the answer is listed as "not required" for either of these systems. Justify that the suppression and detection systems would not be required for NFPA 805 compliance, when the exemptions have been carried forward based on the suppression and detection. Include in your justification similar issues regarding fire areas WP2, WP3, BOP and other areas that have similar issues. Similarly, as fire risk evaluations are performed to demonstrate compliance with NFPA 805 reliance on suppression and detection, the B-3 Table entry should consider these requirements as well. If for "suppression and detection systems required", only a limited amount or localized area is actually required rather than the entire area, provide a list and description of those limited system areas where they remain necessary to justify previously approved exemptions or fire risk evaluations. If

any systems are relied upon to prevent structural collapse as a means to protect safe shutdown equipment, they should also be addressed in the justification.

RAI 5-70

The LAR provided no discussion of how plant changes not incorporated into the PRA model will be addressed in plant change evaluations. Describe the process for evaluation of such changes, including any screening criteria, expert panel consideration, or other disposition methods, when the changes are not yet included in the PRA model used to support a change evaluation.

RAI 6-1.1

The response to RAI 2-7 states that “specific performance goals [will be] established to measure the effectiveness of the fire protection program.” The response to RAI 6-1 states “A Project Instruction for the monitoring program is being developed mirroring the process described in NUMARC 93-01” and that this project instruction will be converted to an ONS procedure for implementation. The response to RAI 5-21 identifies some parameters that ONS plans to use to develop to assess risk significance. Clarify how the monitoring program will be developed using the processes and guideline values used in NUMARC 93-01 (i.e., explain “mirroring”). Since NUMARC 93-01 provides guidance on developing a monitoring program required by the Maintenance Rule, clarify how NUMARC 93-01 is being adapted for the NFPA 805 fire FPP. In the response, specifically address LERF which, while not addressed in the NUMARC 93-01 process for establishing risk significant criteria, is a required element of NFPA 805 fire risk evaluations.

RAI 6-1.2

The response to RAI 6-1 states that “The performance criteria used should be availability, reliability, or condition monitoring, as appropriate.” This is a change from the NFPA 805 Section 2.6.1 requirement that “Acceptable levels of availability, reliability, and performance shall be established.” The NRC staff understands that performance with regard to fire protection systems and equipment should relate to measurement of physical attributes that demonstrate the ability to functionally deliver some needed aspect to meet the nuclear safety performance criteria. If the required component was a pump, performance would mean the ability to meet certain developed head and flow criteria. Changing the wording to condition monitoring changes the focus to address such things as vibration monitoring and thermographic monitoring for a pump, and thrust and/or torque measurement for a valve. Not all of these activities would necessarily verify the required performance aspects of the component. Provide an explanation for how condition monitoring fully meets the intent of the requirement in NFPA 805 to include performance in the monitoring program.

ONS RAI 7-1.1

The response to RAI 7-1 states that “Personnel qualification requirements consistent with Section 2.7.3.4 of NFPA 805 will be developed for ONS personnel prior to application of generic fire modeling treatments in subsequent fire scenario development activities.” This statement intimates that the generic fire modeling treatments will be the only fire modeling approach used at ONS in the future. Clarify whether this is true and, if not, elaborate on how ONS will ensure that personnel performing fire modeling in the future will meet the requirements of NFPA 805 Section 2.7.3.4 with regards to being competent in that field and experienced in the application of these methods as they relate to nuclear power plants, nuclear power plant fire protection, and power plant operations. Also address this issue with regards to the qualifications of personnel performing Fire PRA development.

March 8, 2010

Mr. Dave Baxter
Vice President, Oconee Site
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 - REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TRANSITION TO TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, SECTION 50.48(c), NATIONAL FIRE PROTECTION ASSOCIATION STANDARD NFPA 805 (TAC NOS. MD8822, MD8823, AND MD8824)

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Sincerely,

/RA/

John Stang, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosure:
RAI

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DATE	3/8/10	3/8/10	01/22/2010	3/8/10	3/8/10

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