DAVE BAXTER
Vice President
Oconee Nuclear Station

Duke Energy
ON01VP / 7800 Rochester Highway
Seneca, SC 29672

864-873-4460
864-873-4208 fax
dave.baxter@duke-energy.com

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U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station, Units 1, 2, and 3
Docket Numbers 50-269, 50-270, and 50-287
Request for Additional Information regarding the License Amendment Request to adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants (2001 Edition)
License Amendment Request (LAR) 2008-01

In accordance with 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke Energy) proposes to amend Renewed Facility Operating Licenses (FOLs) Nos. DPR-38, DPR-47, and DPR-55. This License Amendment Request (LAR) requests Nuclear Regulatory Commission (NRC) review and approval for adoption of a new fire protection licensing basis which complies with the requirements in 10 CFR 50.48(a), 10 CFR 50.48(c), and the guidance in Regulatory Guide (RG) 1.205. The LAR was submitted to the NRC on April 14, 2010.

The NRC issued a formal request for additional information (RAI) on July 30, 2010. Duke Energy requested an extension for the response on August 26, 2010 and submitted the response, as stated, on September 13, 2010.

The NRC issued additional RAIs on August 25, 2010. Enclosure 1 provides the responses for these RAIs with the exception of RAI 5-80. RAI 5-80 is being revised by the NRC and does not require a written response at this time.

There are no new commitments being made as a result of this supplement. Other activities requiring further actions will be tracked in the corrective action program and are not considered commitments.

If there are any questions regarding this submittal, please contact Reene' Gambrell at (864) 873-3364 or David J. Goforth at (704) 382-2659.

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 27, 2010.

Sincerely,

Dave Baxter, Vice President
Oconee Nuclear Station

Enclosure:

1. Request for Additional Information regarding the License Amendment Request to adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants (2001 Edition)

cc: w/o enclosures

Mr. Luis Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission - Region II
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

Mr. John Stang, Project Manager
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Mail Stop O-8 G9A
Washington, D. C. 20555

Mr. Paul Lain, NFPA-805 Program Manager
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Mail Stop O-10 C15
Washington, D. C. 20555

Mr. Andy Sabisch
Senior Resident Inspector
Oconee Nuclear Station

Susan E. Jenkins, Manager
Radioactive & Infectious Waste Management
SC Dept. of Health and Env. Control
2600 Bull St.
Columbia, SC 29201

ENCLOSURE 1

REQUEST FOR ADDITIONAL INFORMATION REGARDING THE LICENSE AMENDMENT REQUEST TO ADOPT NFPA 805 PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION FOR LIGHT WATER REACTOR GENERATING PLANTS (2001 EDITION)

ENCLOSURE 1

REQUEST FOR ADDITIONAL INFORMATION REGARDING THE LICENSE AMENDMENT REQUEST TO ADOPT NFPA 805 PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION FOR LIGHT WATER REACTOR GENERATING PLANTS (2001 EDITION)

REQUEST FOR ADDITIONAL INFORMATION (RAI) 3-16.1:

The response to RAI 3-16, regarding additional information on the multiple spurious operation (MSO) expert panel, referred to Section 7.4, Attachment D, and Attachment E of the Oconee Nuclear Station (ONS) site document "ONS FPRA Component Selection" (OSC-8978), which was submitted to the NRC docket (ADAMS Accession No. ML072180334 dated July 25, 2007). The document submitted to the NRC was "Draft A," while Revision 2 of this document was used in the revised license amendment request (LAR). Given the revisions to this document since the original submission provide the following:

- A general description of the composition of the expert panel, including number of plant/Duke staff participating, disciplines and experience represented by the participants, and use of contractors/independent experts.

- An expanded description of the expert panel process that includes a description of the process used to reach a consensus on the MSOs kept for further assessment and a description of the criteria used in the selection process.

- A list of MSOs that were reviewed and the source of each MSO reviewed (plant unique issue identified by the expert panel, generic industry MSO lists, operating experience, industry guidance documents, etc.).

RAI 3-16.1 RESPONSE:

Bullet 1 response:

The ONS expert panel included nine Duke Energy employees and one vendor. A listing of the participants is provided in Attachment E (page E-2) of calculation, OSC-8978, Revision 3. The calculation is available on the SharePoint site. The disciplines and experience of the individual participants include:

- Engineers: Fire Protection, Electrical, Mechanical, PRA
- Licensed Professional Engineers
- Operations Experience: Senior Reactor Operators, Shift Technical Advisors, Management
- Fire Protection Experience: Appendix R, Safe Shutdown, Classical, PRA, System Design
- Industry Committee/Task Force Members

Bullet 2 response:

The expert panel process is discussed in Section 7.4 of calculation, OSC-8978, Revision 3. The calculation is available on the SharePoint site.

Bullet 3 response:

The list and source of MSO's reviewed is contained in Attachment D of calculation, OSC-8978, Revision 3. The list considered industry wide MSO experience documented in WCAP-16933-NP, MSOs from the PWR Generic List of Fire-Induced Multiple Spurious Operation Scenarios, and plant unique issues identified by the expert panel review. Attachment E of calculation OSC-8978 is the ONS MSO Expert Panel Meeting Minutes and provides discussions from the MSO meeting. The calculation is available on the SharePoint site.

RAI 6-2:

Section 4.6 of the LAR provides a description of the process that will be used to develop a monitoring program for ONS that is compliant with NFPA 805, Section 2.6. Providing a description of a "process" however does not meet the requirement of NFPA 805, and the guidance in NEI 04-02, to "establish" a monitoring program. Specifically, sufficient details of the monitoring program need to be provided to support an NRC staff conclusion of reasonable assurance that the ONS monitoring program will meet the requirements of NFPA 805, Sections 2.6.1, 2.6.2, and 2.6.3. In this regard, provide the following:

- Describe the ONS fire protection program system and features, and the attributes of those systems and features, which are included in the monitoring program.

- Describe the process used to identify the systems and features to be included in the program. For those systems chosen, describe how the system boundaries are defined. Also, identify the types of support systems (such as power, control, and instrumentation) that will be included in the monitoring program.

- If systems are already monitored in the Maintenance Rule, describe the attributes of those systems that will be added to the current program to meet the requirements of NFPA 805.

- If an expert panel was used or will be used, describe the composition of the expert panel (disciplines and experience) and the process the expert panel did or will use to identify fire protection systems and features to be included in the monitoring program. Describe the criteria, including both non-risk and risk criteria, that was used or will be used to identify the systems and features included in the program and how the criteria were derived.

- Describe the criteria and methods used to establish acceptable and target levels of availability, reliability, and performance for each of the fire protection systems and

features included in the monitoring program. Describe how the criteria were derived and the basis for why the established levels are acceptable. Describe how the monitoring methods consider ONS and industry operating experience. If the criteria were established for "classes" of systems and features, or performance monitoring groups (PMGs), describe the PMGs established for ONS and which fire protection systems and features are included in each of these groups.

- Describe the criteria used to determine when a system or feature has failed to perform its required function. Describe how the criteria were derived. How is failure to be documented and tracked? Will additional monitoring be required for a specific time period after the system or feature has been repaired, retested and returned to service?

- Describe how monitoring data is collected and maintained for use in performance monitoring. How often is the monitoring data updated, reviewed, and documented?

- Describe how the monitoring program ensures that the assumptions in associated engineering analyses remain valid.

- Describe how the ONS corrective action process will be used to maintain acceptable performance and, when necessary, to bring the performance of fire protection systems and features back into acceptable levels of performance.

RAI 6-2 RESPONSE:

As described in section 4.6 of the LAR, NFPA 805 Section 3.2.3(3) requires that procedures be established for reviews of the fire protection program related performance and trends. NFPA 805, Section 2.6 requires a monitoring program that in part is to establish acceptable performance levels and a method to monitor and assess the performance of the fire protection program. The NFPA 805 requirements for reviews of programs related to performance and trending is provided under the NFPA 805 Monitoring program. While all details have not been finalized, sufficient details are described below to provide assurance that the requirements of NFPA 805 are satisfied.

It was determined that an expert panel was not required because of the specialized nature of the Fire Protection systems and features which only affect selected plant disciplines, therefore an expert panel was not used to evaluate the fire protection systems and features. A calculation, OSC-9887, ONS NFPA 805 Monitoring Program Scoping Calculation, is being developed to document and describe the methodology along with the criteria used to select Fire Protection systems and features for inclusion in the NFPA 805 monitoring program. A multidisciplinary review team is being utilized to review and check the calculation. Representatives from Operations, Fire Protection, PRA and Safe Shutdown are among the review team. All individuals are highly experienced and qualified to the Duke Energy training program requirements for their positions and for calculations.

Determination of the scope of fire protection components and programmatic elements included in the monitoring program began with a review of all applicable supporting calculations associated with the NFPA 805 Transition effort. This involved the identification of credited fire protection systems and features that have some functional role in fire risk reduction in the applicable supporting calculations. The components and programmatic elements determined to be credited in these supporting calculations are identified. The supporting engineering analyses which were reviewed are listed below:

- Fundamental Fire Protection Program: B-1 Table Engineering Calculation
- Nuclear Safety Capability Assessment: B-2 Table Engineering Calculation
- Fire Area Transition: B-3 Table Engineering Calculation
- Fire Risk Evaluations: Fire Area Engineering Calculations
- Fire PRA Engineering Analysis and Engineering Calculations
- Radioactive Release Analysis: G-1 Table and Engineering Calculation
- Licensing Action Review Engineering Calculation

Various structures, systems and components (SSC's, other than fire protection components) perform functions or support assumptions that may be credited in Nuclear Safety Capability Assessment (NSCA), Fire Probabilistic Risk Analyses (FPRA), or other NFPA 805 supporting analyses in order to reduce risk due to fire in a particular fire zone or fire area. These NFPA 805 credited SSCs are therefore required to be evaluated to determine if additional monitoring of the components is required. Typically NSCA SSCs are monitored as part of Maintenance Rule monitoring. NSCA SSCs credited in the NFPA 805 analyses is being reviewed to validate that the availability and reliability is monitored as part of the Maintenance Rule and that the criteria is adequate to meet the needs of NFPA 805.

Individual components perform functions that may be credited in the supporting analyses in order to reduce risk values for a particular fire zone or fire area. The credited plant components are therefore required to be monitored for availability and reliability to ensure that their functions will be accomplished as assumed in the supporting analyses. A credited function may be performed by a number of individual components in a given fire area. For example, a fire detection function in a given fire zone may be accomplished by a combination of individual detectors. For monitoring purposes, these individual detectors would be grouped together to form a performance monitoring group (PMG) for that particular fire zone. Criteria for reliability and availability will be established at the PMG or functional level. PMGs are used for the water and gaseous based suppression systems, detection systems, fire barriers, water supplies, hose and hydrant systems, etc., as described in the example Table below:

Note: This table is only a draft and the PMG groupings are subject to change pending final approval of the OSC-9887 calculation.

PMG	FUNCTION/SYSTEM	COMPONENTS (EQUIPMENT ID LEVEL)
SS	Suppression Water Supply	• Fire Pumps and Controls • Underground piping and Valves • Isolation and Sectionalizing Valves • Supply Piping and Valves Inside Plant Structures
S	Water Suppression Systems	• Wet Pipe Sprinkler Systems • Dry Pipe Sprinkler Systems • Deluge Valves and Associated Controls • Actuation Detectors
SG	Gaseous Suppression Systems	• Halon Systems and Components • CO2 Systems and Components
B	Barriers/Separation	• Fire Walls • Fire Doors • Penetration Seals • Fire Dampers • Structural Steel Fireproofing • Electrical Raceway Fire Barrier Systems
FB	Manual Firefighting	• Hose Stations • Fire Hydrants • Fire Extinguishers • Emergency Lighting • Other Portable Firefighting Equipment • Smoke Removal
D	Detection Systems	• Annunciation Detectors
DP	Detection Panels	• Fire Detection Monitoring and Control Panels
P	Programmatic Elements	• Combustible Control Program (NSD 313) • Control of Hot Work (NSD 314) • Fire Protection Impairment Program • Fire Brigade Response • Pre Fire Plans
OC	RCP Oil Collection System	• Equipment Associated with RCP Oil Collection System

Programmatic elements such as fire brigade performance, firewatches, combustible controls, etc., will be evaluated using the existing program health process as described in EDM-201 and EDM-203. Target values of reliability and availability cannot be assigned to these so their effectiveness is based on the objective and anecdotal evidence evaluated by the engineers in charge of the programs as is currently practiced.

The availability and reliability criterion for PMGs is being defined using the guidance included in several industry documents. The EPRI Fire Protection Equipment Surveillance Optimization and Maintenance Guide 1006756, Final Report July 2003 was used, as was the NRC Fire

Protection Significance Determination Process. Calculation OSC-9375, Oconee Fire PRA Scenario Development, was also used to determine components relative contribution to risk reduction in the analysis. For each PMG in a High Safety Significant fire zone, the relative assumed risk reduction contribution of the individual components within the PMG is assessed to determine the availability and reliability criteria for those components. Individual components may be credited in several analyses, and it is necessary to use conservatism when determining the availability and reliability goals for those components to ensure values that are bounding for all the analyses

Availability – Per NFPA 805, this is defined as the specific probability that the system, structure or component (SSC) or PMG of interest is functional at a given point in time. For the purposes of the ONS Monitoring program, it is referred to as "unavailability" and is defined as the time an SSC or PMG is not capable of performing its intended function when required.

Target Availability - The availability attribute will have an associated target availability goal for each SSC or PMG that will be determined by industry and ONS operating experience and engineering judgment. The Target Availability Goal for each SSC or PMG is determined by the ONS NFPA 805 Monitoring Program Scoping Calculation.

Reliability – Per NFPA 805, this is defined as a measure of the expectation (assuming that the SSC or PMG is available based on industry reported or site specific failure data) that the SSC or PMG will perform its function upon demand at any future instant in time. For the purposes of the ONS Monitoring program, it is the probability that the SSC of interest will function without failure for a given interval of time or number of cycles. For standby SSCs, this includes the probability of success upon demand.

Target Reliability – The reliability attribute will have an associated target reliability goal for each SSC or PMG that will be determined by industry experience, equipment manufacturer's specifications and engineering judgment. The Target Reliability Goal for each SSC or PMG is determined by the ONS NFPA 805 Monitoring Program Scoping Calculation.

Initial availability and reliability criteria values for PMGs are established in the ONS NFPA 805 Monitoring Program Scoping Calculation. It is recognized that this criteria may require adjustment by the System/Program Engineer or multidisciplinary review team as the Monitoring Program becomes established and monitoring data is gathered over a period of time. Values of availability and reliability are intended to be bounding for the assumptions made in the applicable supporting analyses with some margin built in. The ONS NFPA 805 Monitoring Program is much like the Maintenance Rule Monitoring Program, in that failure to meet availability and/or reliability criteria results in the initiation of a Problem Investigation Process (PIP), which documents the resolution of the performance shortfall by establishing performance goals and corrective actions to return the component or PMG into compliance with established criteria.

A software program still under development will be used to collect real time data from the corrective action program (PIP), Work Order Tracking and Fire Impairment Log to calculate

values of availability and identify failures for reliability of SSCs identified as being monitored by NFPA 805 in the ONS Equipment Database. This data will be periodically evaluated by the appropriate system or program engineers and quarterly reports of NFPA 805 performance will be produced similar to the existing quarterly reports being produced within the Fire Protection Health Reports. The instructions for this program are contained in a planned revision to Duke Energy Procedure EDM-203, Equipment Reliability Program. Calculation OSC-9887 will be made available on the SharePoint site once it is approved.

RAI 7-5:

Section 4.7.2 of the LAR describes the configuration control process used at ONS and how plant changes are assessed for impact on the fire protection program. It is unclear from the information provided how plant and program changes that have been/will be made prior to and during the NFPA 805 transition period are assessed for impact on the NFPA 805 fire protection program prior to its actual implementation at ONS. Specifically, the NFPA 805 pilot plant program was started over 2 years ago, and the NFPA 805 transition period for ONS is expected to be 18 months. Plant configurations that change during the assembly of the NFPA 805 fire protection program may impact the assumptions and limitations of the ongoing analysis. Explain how plant changes made since the start of the NFPA pilot program and plant changes that may be made during the NFPA 805 transition period are assessed for impact on the NFPA 805 fire protection program. Explain how these assumptions and limitations are maintained current or revisited prior to implementation of the NFPA 805 program. While performing engineering and licensing (10 CFR 50.59) reviews for plant changes, explain how the NFPA 805 transition project is kept in concert with the changing plant and programs. Explain how the NFPA 805 fire protection program and/or project personnel are involved in the reviews of design changes and program alterations.

RAI 7-5 RESPONSE:

ONS evaluates potential impact on the Fire Protection Program during transition to NFPA 805 through the implementation of EDM-601, Engineering Change Manual, which controls permanent and temporary design changes to the facility. EDM-601 contains evaluation criteria that must be reviewed to determine if the design could have potential fire protection program impact. Changes were incorporated into the EDM-601 evaluation criteria to include questions specifically related to attributes that may impact NFPA 805. The evaluation criteria are reviewed during the development of the plant design change. If this evaluation identifies potential impact, then a more detailed review is performed by qualified fire protection, safe shutdown, and PRA personnel who are involved with the ongoing NFPA 805 transition activities.

The NFPA 805 Nuclear Safety Capability Assessment (NSCA) calculation was generated as part of the transition to NFPA 805. Several revisions and evaluations of the calculation have been performed due to changes in plant configurations. A final update and evaluation of plant changes is planned during the NFPA 805 implementation period. This revision in conjunction with the EDM-601 evaluation criteria provides assurance that plant changes have been properly integrated into the NFPA 805 transition.

A review of implemented plant changes is also performed by the PRA organization to determine potential model impacts. A review of plant changes will be performed during the NFPA 805 implementation period to ensure that changes are appropriately evaluated for potential impact on the PRA model.

The Fire Protection Program Licensing basis is also maintained through fire protection program reviews conducted in accordance with NSD-320, Guidance for Performing Licensing Review of Proposed Changes to the Fire Protection Program. This fire protection program review is performed based on fire protection screening criteria contained in NSD-228, Applicability Determination. NSD-228 contains evaluation screening questions which if impacted requires a fire protection program licensing evaluation by qualified fire protection or safe shutdown engineers which, as noted above, are cognizant of and involved in ongoing NFPA 805 transition activities. NSD-320 will be updated as part of the implementation period to address the NFPA 805 Change Evaluation Process.

In conclusion, the plant processes described above have been in place during the NFPA 805 transition to identify changes that may impact the fire protection program. Additionally, a comprehensive update of the NFPA 805 analyses is planned as part of the NFPA 805 implementation period to reflect the current plant configurations. The update will include review of plant configuration changes along with changes that may have occurred from RAI responses, updates from industry groups for MSO configurations, new or revised FAQ's, and development of the PSW modification. This final review will ensure current plant configurations are appropriately reflected and evaluated in the NFPA 805 documentation prior to full implementation of NFPA 805.