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~~The Attachment W pages to this letter contain security related information. Withhold from public disclosure in accordance with 10 CFR 2.390. When the Attachment W pages are removed, this document is no longer security related.~~

CNS-16-014

March 23, 2016

10 CFR 50.90

U.S. Nuclear Regulatory Commission (NRC)
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Energy Carolinas, LLC (Duke Energy)
Catawba Nuclear Station, Units 1 and 2
Docket Numbers 50-413 and 50-414
License Amendment Request (LAR) to Adopt National Fire Protection Association (NFPA) 805 Performance-Based Standard for Fire Protection for Light-Water Reactor Generating Plants
LAR Supplement to Correct a Legacy Submittal Discrepancy and to Revise a Modification Commitment
(TAC Nos. MF2936 and MF2937)

References: Letters from Duke Energy to the NRC, dated September 25, 2013 (ADAMS Accession Number ML13276A503), January 13, 2015 (ADAMS Accession Number ML15015A409), January 28, 2015 (ADAMS Accession Number ML15029A697), February 27, 2015 (ADAMS Accession Number ML15065A107), March 30, 2015 (ADAMS Accession Number ML15091A339), April 28, 2015 (ADAMS Accession Number ML15119A533), July 15, 2015 (ADAMS Accession Number ML15198A036), August 14, 2015 (ADAMS Accession Number ML15231A010), September 3, 2015 (ADAMS Accession Number ML15310A123), December 11, 2015 (ADAMS Accession Number ML15350A014), and January 7, 2016 (ADAMS Accession Number ML16011A121)

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The reference letters comprise in their entirety Duke Energy's request for 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, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants", Revision 1, dated December 2009. The September 25, 2013 reference LAR was developed in accordance with the guidance contained in Nuclear Energy Institute (NEI) 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)", Revision 2.

The purpose of this LAR supplement is twofold:

1. Duke Energy is resolving a discrepancy that was recently discovered in the NFPA 805 Safe Shutdown Analysis. The NFPA 805 Nuclear Safety Capability Assessment was discovered to contain a legacy discrepancy that does not match the current Safe Shutdown Analysis. This led to an omission of a Variance From Deterministic Requirement (VFDR) from the September 25, 2013 reference LAR. This discovery was entered into the Catawba Corrective Action Program on February 22, 2016. Since that time, Duke Energy has performed an extent-of-condition evaluation (no additional discrepancies were found) and has revised the affected NFPA 805 LAR document pages. These pages are contained herein and include: 1) a Compact Disc (CD) copy of entire Attachment C, "NFPA 805 Ch 4 Compliance (NEI 04-02 Table B-3)" (a CD copy is being provided as this entire attachment was affected by repagination and comprises 697 pages; the actual revised pages are 19, 24, 31, and 36); and 2) a paper copy of the revised pages of Attachment W, "Fire PRA Insights". The revised Attachment C and Attachment W pages have the revisions designated by revision bars.
2. Duke Energy is revising a regulatory commitment associated with the mitigation of internal flooding concerns in the Auxiliary Feedwater (AFW) pump rooms. The revised commitment is shown on the revised page of LAR Attachment S, "Modifications and Implementation Items", which has the revision designated by revision bar. Also included is a re-transmittal of the entire final LAR Attachment S, which is designated as Revision 5 and has all revision bars removed. This constitutes the final clean copy of Attachment S for referencing in the Facility Operating Licenses. The revised Attachment W pages resulting from this revised commitment have the revisions designated by revision bars.

Duke Energy has determined that the revised Attachment W pages should be considered as Sensitive Unclassified Non-Safeguards Information (SUNSI) and has designated these pages as so. Duke Energy is requesting that the enclosed Attachment W pages be withheld from public disclosure in accordance with 10 CFR 2.390.

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The conclusions of the No Significant Hazards Consideration and the Environmental Consideration contained in the September 25, 2013 reference LAR are unaffected by this LAR supplement.

Except as indicated above, there are no regulatory commitments contained in this letter or its enclosure.

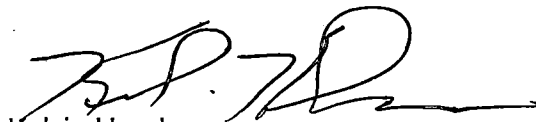
Pursuant to 10 CFR 50.91, a copy of this LAR supplement is being sent to the appropriate State of South Carolina official.

Inquiries on this matter should be directed to L.J. Rudy at (803) 701-3084.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 23, 2016.

Very truly yours,

A handwritten signature in black ink, appearing to read 'K. Henderson', written over a horizontal line.

Kelvin Henderson
Vice President, Catawba Nuclear Station

LJR/s

Enclosure

~~The Attachment W pages to this letter contain security related information. Withhold from public disclosure in accordance with 10 CFR 2.390. When the Attachment W pages are removed, this document is no longer security related.~~

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xc (with enclosure):

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Enclosure

NFPA 805 LAR Revised Pages and Compact Disc

**Duke Energy Carolinas, LLC
Catawba Nuclear Station**

**Transition to 10 CFR 50.48(c) - NFPA 805
Performance-Based Standard for Fire Protection for
Light Water Reactor Electric Generating Plants, 2001
Edition**



**Transition Report
Revision 5**

March 2016

Table S-2a Plant Modifications Committed – Internal Events PRA

Item	Rank	Unit	Problem Statement	Proposed Modification	In IEPRA	Comp Measure	Risk Informed Characterization
01	High	1, 2	Auxiliary Shutdown Panels A and B are located in the CA (Aux. Feed water) Pump room and are theoretically susceptible to being rendered non-functional by an internal flood from a pipe break at a higher elevation within the Auxiliary Building.	Isolation of fire protection piping in the 560' and 577' elevation electrical penetration rooms. Completion Date: December 31, 2017	Y	N	This modification will provide an internal flood risk reduction to offset the Fire PRA risk increase post-transition.
02			Deleted via Letter CNS-15-101.				
03	High	1, 2	The current installation and maintenance program of the turbine building siding fasteners leave the siding susceptible to being affected by low speed (73-114 mph) straight line winds thus increasing the PRA risk probability of a LOOP event.	Replace/upgrade turbine building siding fasteners and institute a preventative maintenance program to periodically inspect the fasteners. Completion Date: December 31, 2017	Y	N	This modification will provide an internal events high winds risk reduction to offset the Fire PRA risk increase post-transition.

S. Modifications and Implementation Items

11 Pages Attached

Tables S-1, Plant Modifications Completed, S-2a, Plant Modifications Committed – Internal Events PRA, and S-2b, Plant Modifications Committed – Fire PRA, provided below, include a description of the modifications along with the following information:

- A problem statement,
- Risk ranking of the modification,
- An indication if the modification is currently included in the Fire PRA,
- Compensatory Measure in place, and
- A risk-informed characterization of the modification and compensatory measure.

Table S-1 Plant Modifications Completed							
Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
NONE							

Table S-2a Plant Modifications Committed – Internal Events PRA

Item	Rank	Unit	Problem Statement	Proposed Modification	In IEPRA	Comp Measure	Risk Informed Characterization
01	High	1, 2	Auxiliary Shutdown Panels A and B are located in the CA (Aux. Feed water) Pump room and are theoretically susceptible to being rendered non-functional by an internal flood from a pipe break at a higher elevation within the Auxiliary Building.	Isolation of fire protection piping in the 560' and 577' elevation electrical penetration rooms. Completion Date: December 31, 2017	Y	N	This modification will provide an internal flood risk reduction to offset the Fire PRA risk increase post-transition.
02			Deleted via Letter CNS-15-101.				
03	High	1, 2	The current installation and maintenance program of the turbine building siding fasteners leave the siding susceptible to being affected by low speed (73-114 mph) straight line winds thus increasing the PRA risk probability of a LOOP event.	Replace/upgrade turbine building siding fasteners and institute a preventative maintenance program to periodically inspect the fasteners. Completion Date: December 31, 2017	Y	N	This modification will provide an internal events high winds risk reduction to offset the Fire PRA risk increase post-transition.

Table S-2b. Plant Modifications Committed – Fire PRA

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
01	High	2	KSI Inverter Modification to relocate cable in fire area 9.	Cable 2KSI-SKXP for 0ETLPLSKXP will be re-routed from SSF shutdown fire area 9 (Unit 2 Battery Room) to non-SSF shutdown fire area(s). Completion Date: December 31, 2017	N	Y	This cable modification is required for NFPA 805. Compensatory measures will be established when the NFPA 805 fire protection program becomes effective and remain in place until this modification is complete.
02	Med	1	Unit 1 Breaker Coordination issues identified for MCCs 1EMXA, 1EMXB, 1EMXC, 1EMXD, 1EMXI, 1EMXJ, 1EMXK, and 1EMXL.	Remove the incoming breaker and connect wiring directly to the MCC bus for the following MCCs: 1EMXA, 1EMXB, 1EMXC, 1EMXD, 1EMXI, 1EMXJ, 1EMXK, and 1EMXL. Completion Date: December 31, 2017	Y	Y	This coordination modification is required for NFPA 805. The current coordination study is valid for current licensing basis. Compensatory measures will be established when the NFPA 805 fire protection program becomes effective and remain in place until this modification is complete.
03	Med	2	Unit 2 Breaker Coordination issues identified for MCCs 2EMXA, 2EMXB, 2EMXC, 2EMXD, 2EMXI, 2EMXJ, 2EMXK, and 2EMXL.	Remove the incoming breaker and connect wiring directly to the MCC bus for the following MCCs: 2EMXA, 2EMXB, 2EMXC, 2EMXD, 2EMXI, 2EMXJ, 2EMXK, and 2EMXL. Completion Date: December 31, 2017	Y	Y	This coordination modification is required for NFPA 805. The current coordination study is valid for current licensing basis. Compensatory measures will be established when the NFPA 805 fire protection program becomes effective and remain in place until this modification is complete.

Table S-2b Plant Modifications Committed – Fire PRA

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
04	Med	1, 2	Breaker Coordination issues identified on load side of EDE and EDF breakers.	Install fuses on the load side of EDE and EDF breakers. Involves 4 breakers on EDE and 3 on EDF. Mount new fuses in each panel. Completion Date: December 31, 2017	Y	Y	This coordination modification is required for NFPA 805. The current coordination study is valid for current licensing basis. Compensatory measures will be established when the NFPA 805 fire protection program becomes effective and remain in place until this modification is complete.
05	Med	1, 2	Spurious valve operation with Breaker Coordination issues identified with 600 VAC MCCs.	Remove the fuse from the Motor Operator Heater circuit for 1CA VA0050A and 2CAVA0050A. Completion Date: December 31, 2017	Y	Y	This spurious operation modification is required for NFPA 805. The current deterministic analysis is valid for current licensing basis. Compensatory measures will be established when the NFPA 805 fire protection program becomes effective and remain in place until this modification is complete.
06	Med	1, 2	Spurious valve operation with Breaker Coordination issues identified with 600 VAC MCCs.	Route new cables for the normally energized circuits on 1WLLS5900 and 2WLLS5900. Completion Date: December 31, 2017	Y	Y	This spurious operation modification is required for NFPA 805. The current deterministic analysis is valid for current licensing basis. Compensatory measures will be established when the NFPA 805 fire protection program becomes effective and remain in place until this modification is complete.

Table S-2b Plant Modifications Committed – Fire PRA

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
07	Med	1, 2	TDCAP is susceptible to fire in the ETA/ETB Switchgear Rooms.	<p>Cable routes modified such that the TDCAP will remain available in the event of a fire in the ETA or ETB Switchgear Room.</p> <p>Completion Date: December 31, 2017</p>	Y	Y	<p>This modification is required for NFPA 805. The modification will ensure that the TDCAP is available in addition to the already credited opposite train motor driven CA pump for a fire in the ETA or ETB Switchgear Rooms.</p> <p>Compensatory measures will be established when the NFPA 805 fire protection program becomes effective and remain in place until this modification is complete.</p>

Table S-3, Items provided below are those items (procedure changes, process updates, and training to affected plant personnel) that will be completed prior to the implementation of new NFPA 805 fire protection program. This will occur within 180 days after issuance of the license amendment unless that date falls within a scheduled refueling outage. Then, implementation will occur within 60 days after startup from that scheduled refueling outage. Note Item 13 is associated with modifications in Table S-2b and will be completed 180 days after completion of the last risk related modification.

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
1	1, 2	<p>Perform the following recommendations from the Radiological Release Evaluation:</p> <ol style="list-style-type: none"> 1. Within each yard area fire strategy, identify radiologically controlled area boundaries within the strategy and any potential escape paths. This includes building sumps and storm drains, where applicable. For consistency, it is recommended that even hardened barriers are identified. Examples of these would include: hatches, passage doors, and roll-up doors. 2. Enhance the appropriate existing procedures or guidelines, or create a new procedure or guideline, to include more detail on the control measures used to maintain radioactive release limits where monitoring cannot be accomplished. Examples include: <ul style="list-style-type: none"> ▪ Water fog streams used for smoke scrubbing ▪ Controlling water runoff during fire suppression activities ▪ Covering drains and other similar containment measures 3. Enhance Fire Brigade Guidelines (Procedure RP-29) to instruct Radiation Protection personnel to respond to fires where there are radiological concerns inside and outside the Protected Area. 4. Enhance the appropriate existing procedures or guidelines, or create a new procedure or guideline, to include guidance for crossing RCA/Radioactive Control Zone boundaries including escape routes. 5. Create new fire strategies for yard areas that contain RCAs. This includes the following: <ul style="list-style-type: none"> ▪ Retired Steam Generator Storage Facility (Building 7777) 	4.4.2 and Attachment E

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
		<ul style="list-style-type: none"> ▪ Radiation Materials Control Building (Building 7767) ▪ Hold-Up Ponds ▪ Radiography Vault ▪ Radioactive Materials Containers ▪ Tents Containing Radioactive Material ▪ Mixed Waste Storage ▪ ISFSI Storage of non-ISFSI Radioactive Materials <p>6. Within each fire strategy, identify the Radiologically Controlled Area (RCA) or Radioactive Control Zone in the written text.</p> <p>7. Fire Brigade training will be revised to ensure the new guidance proposed in Recommendations 2, 3 and 4 for radioactive release is covered during the established training interval.</p> <p>8. Add a standard statement for smoke and water runoff to all radiologically controlled area fire strategies to prompt measures to avoid radioactive release.</p> <p>9. Incorporate all fire fighting strategies into the electronic records management retrieval system (internally referred to as NEDL). This will provide consistency for current users and the ability to conduct effective reviews to ensure all radioactive release recommendations have been incorporated.</p> <p>10. Add an appendix to the fire strategies for building sump drainage and site storm drains. This is NOT intended to be a detailed plan, but a site overview that identifies areas where runoff has the potential to route to a storm drain or an automatic sump that will pump without radiation monitoring.</p> <p>11. Develop administrative guidance in collaboration with radiation protection to support ensuring that radioactive release(s) do not exceed limits in the event of a fire in areas where engineering controls will not contain the potential release. Attachment A contains a flow chart of the various considerations needed for administrative controls that can be directed via one or more plant procedures depending upon the performing group(s).</p>	

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
2	1, 2	After the approval of the LAR, in accordance with 10 CFR 50.71(e) and approved exemptions, the CNS UFSAR will be revised. The format and content will be consistent with NEI 04-02 FAQ 12-0062.	5.4
3	1,2	The Design Basis Specification for the Plant Fire Protection, which is the primary fire protection program policy document, will be updated to include the statement that the NRC is the AHJ for fire protection changes requiring approval.	Attachment A, 3.2.2.4
4	1,2	Appropriate fire protection program document(s) will be updated to provide a requirement that if a plant elects to implement the methodologies in EPRI Report TR1006756, that the methodologies will be implemented in their entirety as they pertain to the fire protection systems or features being evaluated.	Attachment A, 3.2.3(1)
5	1,2	The monitoring program required by NFPA 805 Section 2.6 will be implemented after the LAR approval as part of the fire protection program transition to NFPA 805, in accordance with NFPA 805 FAQ 10-0059, and will include a process that reviews fire protection performance and trends in performance. Program specifics are provided in LAR Section 4.6.2.	4.6.2, Attachment A, 3.2.3(3)
6	1,2	Revise station procedures/directives to comply with NFPA 805 Section 3.3.1.2(1).	Attachment A, 3.3.1.2(1)
7	1,2	Appropriate station documentation will be updated to include the requirements for installation of cable above suspended ceilings.	Attachment A, 3.3.5.1
8	1,2	The Fire Strategies will be reviewed and updated to include any changes to equipment important to nuclear safety and other updates pertinent to the NFPA 805 Transition.	Attachment A, 3.4.2.1
9	1,2	The Fire Protection Design Basis Document described in Section 2.7.1.2 of NFPA 805 and necessary supporting documentation described in Section 2.7.1.3 of NFPA 805 will be created as part of transition to 10 CFR 50.48(c) to ensure program implementation following receipt of the safety evaluation. Appropriate cross references will be established to supporting documents as required by Duke Energy processes.	4.7.1

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
10	1, 2	Ensure the CNS configuration control process follows the requirements in NFPA 805 and the guidance outlined in RG 1.174 which requires the use of qualified individuals, procedures that require calculations be subject to independent review and verification, record retention, peer review, and a corrective action program that ensures appropriate actions are taken when errors are discovered. The configuration control requirements should be implemented in accordance with FAQ 12-0061.	4.7.2
11	1, 2	Develop Engineering training guidelines to identify and document required training and mentoring to ensure individuals are appropriately qualified per the requirements of NFPA 805 Section 2.7.3.4 to perform assigned work.	4.7.3
12	1, 2	<p>Revise Shutdown Risk Management procedures to reflect the following recommendations during higher risk evolutions from the calculation entitled, "NFPA 805 Transition Non-Power Fire Area Assessments (Pinch Points Analysis)":</p> <ul style="list-style-type: none"> ▪ Include CNS specific HRPOS definition. ▪ Limit hot work in affected fire area during Higher Risk Plant Operating States (HRPOS's). ▪ Prohibit hot work in affected fire areas during Higher Risk Plant Operating States (HRPOS's). ▪ Verify that the available fire detection systems located in the affected fire areas are functional. Post firewatch per SLCs in affected fire areas prior to entering Higher Risk Plant Operating States if system(s) are impaired. ▪ Verify that the available fire suppression systems located in the affected fire areas are functional. Post firewatch per SLCs in affected fire areas prior to entering Higher Risk Plant Operating States if system(s) are impaired. ▪ Limit transient combustible storage in affected fire areas during Higher Risk Plant Operating States (HRPOS's). ▪ Prohibit transient combustible storage in affected fire areas during Higher Risk Plant Operating States (HRPOS's). ▪ Provide a firewatch (continuous or periodic) in affected fire areas during Higher Risk Plant Operating States (HRPOS's). 	4.3 and Attachment D

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
		<ul style="list-style-type: none"> ▪ Activities in affected fire areas should be rescheduled to non-Higher Risk Plant Operating States (HRPOS's) periods. 	
13	1, 2	<p>Following installation of the risk related modifications and the as-built installation details, additional refinements surrounding the modification and any procedural implementation items (Table S-3 Items 12 and 16) will be incorporated into the Fire PRA model and Internal Events model, as required. In addition, a verification will be performed to confirm that the risk results are not appreciably changed. If the as-built change-in-risk estimates exceed the RG 1.174 acceptance guidelines, the responsible feature will be identified and evaluated. Actions taken to address such a case may be one or more of the following: 1) implementing additional modifications, 2) refining the analytical estimates, or 3) requesting that exceeding the guidelines be deemed acceptable in a new LAR.</p>	4.8.2
14	1, 2	<p>Develop formal training program for nonfire brigade personnel that respond to a fire incident.</p>	Attachment A, 3.4.3(b)
15	1, 2	<p>Revise the QA Topical, as appropriate, to update the definition of QA 3 to match post NFPA 805 criteria. QA Topical currently defines QA 3 as: <i>"QA Condition 3 covers those systems, components, items, and services which are important to fire protection as defined in the Hazards Analysis for each station. The Hazards Analysis is in response to Appendix A of NRC Branch Technical Position APCSB 9.5-1."</i></p>	4.7.3
16	1, 2	<p>Implementation items resulting from the feasibility evaluation include:</p> <ul style="list-style-type: none"> ▪ Corrective Action to add equipment tags to the petcocks for the CA valves. These equipment numbers will be added to Fire Procedure, AP/0/A/5500/045. ▪ Corrective Action to revise steps to Fire Procedure, AP/0/A/5500/045 to add valve numbers (or descriptive nomenclature) as applicable to the individual steps for throttling the CA valves (valve to isolate air, bleed air). ▪ Corrective Action to revise steps to Fire Procedure, AP/0/A/5500/045 to include requiring operators to obtain a climbing harness prior to throttling the CA valves locally. ▪ Corrective Action to add steps to Fire Procedure 	Attachment G

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
		<p>AP/0/A/5500/045 to trip the NC pumps locally (if unable to trip from the control room).</p> <ul style="list-style-type: none"> ▪ Corrective Action to add performance of recovery action drills to Operator training. 	
17	1, 2	Update station documentation to indicate requirements for interior floor finishes.	Attachment A, 3.3.3
18	1, 2	Ensure procedures are provided for long-term alignments for makeup of fuel oil, feedwater, and reactor coolant.	4.2.1.2
19	1, 2	Evaluate the transient combustible control procedure for additional controls in the identified fire areas to account for a larger transient fire heat release rate.	RAI PRA-15b