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CNS-17-004

January 26, 2017

10 CFR 50.90

U.S. Nuclear Regulatory Commission (NRC)
Attention: Document Control Desk
Washington, D.C. 20555-0001

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
Response to NRC Request for Additional Information (RAI), and
Revised Attachment S - Modifications and Implementation Items
(TAC Nos. MF2936 and MF2937)

- References:
1. 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), January 7, 2016 (ADAMS Accession Number ML16011A121), March 23, 2016 (ADAMS Accession Number ML16096A262), June 15, 2016 (ADAMS Accession Number ML16169A107), August 2, 2016 (ADAMS Accession Number ML16217A456), and September 7, 2016 (ADAMS Accession Number ML16253A008)
 2. Letter from the NRC to Duke Energy, "Catawba Nuclear Station, Units 1 and 2 - Request for Additional Information Regarding License Amendment Request to Implement a Risk-Informed, Performance-Based Fire Protection Program (TAC Nos. MF2936 and MF2937)", dated December 29, 2016 (ADAMS Accession Number ML16355A392)

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The Reference 1 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.

During a telephone conference call on December 6, 2016, the NRC requested a revision to Attachment S, "Modifications and Implementation Items," Table S-3, Implementation Items 13 and 20. Enclosure 1 to this letter provides the revised entire Attachment S of the final LAR. This revision supersedes the information previously provided in the Reference 1 letter dated June 15, 2016, for the Attachment S, "Modifications and Implementation Items."

The Reference 2 letter transmitted an RAI necessary for the NRC to continue its review of the September 25, 2013, reference LAR. Enclosure 2 to this letter provides the Duke Energy response.

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

There are no new regulatory commitments contained in this letter.

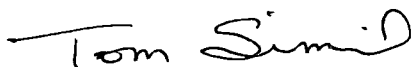
Pursuant to 10 CFR 50.91, a copy of this LAR supplement is being sent to the appropriate State of South Carolina official.

Inquiries on this matter should be directed to Sherry Andrews at (803) 701-3424.

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

Executed on January 26, 2017.

Very truly yours,

A handwritten signature in black ink that reads "Tom Simril". The signature is written in a cursive, flowing style.

Tom Simril
Vice President, Catawba Nuclear Station

Enclosures

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Enclosure 1

Attachment S, Modifications and Implementation Items

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
01	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.	Y	N	This modification will provide an internal events high winds risk reduction to offset the Fire PRA risk increase post-transition.
02	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).	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.

Table S-1 Plant Modifications Completed

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
03	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.	Y	Y	<p>This coordination modification is required for NFPA 805. The current coordination study is valid for current licensing basis.</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>
04	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.	Y	Y	<p>This coordination modification is required for NFPA 805. The current coordination study is valid for current licensing basis.</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>
05	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.	Y	Y	<p>This coordination modification is required for NFPA 805. The current coordination study is valid for current licensing basis.</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-1 Plant Modifications Completed

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
06	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.	Y	Y	<p>This spurious operation modification is required for NFPA 805. The current deterministic analysis is valid for current licensing basis.</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>
07	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.	Y	Y	<p>This spurious operation modification is required for NFPA 805. The current deterministic analysis is valid for current licensing basis.</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-1 Plant Modifications Completed

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
08	Med	1, 2	TDCAP is susceptible to fire in the ETA/ETB Switchgear Rooms.	Cable routes modified such that the TDCAP will remain available in the event of a fire in the ETA or ETB Switchgear Room.	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-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.				

Item 03 originally in Table S-2a has been completed and is shown on Table S-1, Item 01.

Table S-2b Plant Modifications Committed – Fire PRA

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
				All items originally in Table S-2b have been completed and are shown on Table S-1, Items 02 through 08.			

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 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 	
		6. Within each fire strategy, identify the Radiologically Controlled Area (RCA) or Radioactive Control Zone in the written text.	
		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.	
		8. Add a standard statement for smoke and water runoff to all radiologically controlled area fire strategies to prompt measures to avoid radioactive release.	
		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.	
		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.	
		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).	

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	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, 16 and 20) 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.	4.8.2
14	1, 2	Develop formal training program for nonfire brigade personnel that respond to a fire incident.	Attachment A, 3.4.3(b)
15	1, 2	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>	4.7.3
16	1, 2	Implementation items resulting from the feasibility evaluation include: <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
20	1, 2	Perform an evaluation to determine the RCP Seal response to loss of seal cooling due to spurious valve operation caused by a fire.	Letter from Duke Energy to NRC, dated June 15, 2016 (ADAMS Accession Number ML16169A107), Cover Letter Page 2, Purpose Number 2.

Enclosure 2

RAI Response

NRC Request for Additional Information (RAI)

By letter dated September 25, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13276A503), Duke Energy Carolinas, LLC (the licensee) submitted a license amendment request to change its fire protection program to one based on the National Fire Protection Association (NFPA) 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition.

A question has recently been identified regarding whether fire-induced flooding had been analyzed for scenarios involving high density polyethylene (HDPE) piping.

Please provide a description of how potential flooding has been addressed in the analysis. The description should describe how safe shutdown is assured through either demonstrating that the HDPE installations are bounded by existing analysis, or by performing a risk-informed, performance-based evaluation that considers the possibility of flooding. All areas containing HDPE piping should be included in the response.

Duke Energy Response:

High Density Polyethylene (HDPE) piping is installed at Catawba Nuclear Station (CNS) for safety related and non-safety related applications. The safety related application is for the Nuclear Service Water System (RN). The HDPE is installed in an underground (buried pipe) application to deliver cooling water to the Emergency Diesel Generators. There is no fire risk to the piping that could lead to a flooding scenario for this buried HDPE application. In the Auxiliary Building, HDPE piping has been installed to support the maintenance activity of draining the RN system. When not in use, this HDPE piping is drained and isolated from the normal RN system. HDPE is also installed in select systems located in the Unit 1 and Unit 2 Turbine Buildings and the Service Building. In these applications, the piping is not isolated and is typically in service.

The flood response resulting from HDPE piping failure is addressed in two ways.

- 1) HDPE is discussed in CNS Fire Modeling RAI 01L and referenced in CNC-1535.00-00-0222 ("CNS Fire PRA Thermal Analysis of High Density Polyethylene (HDPE) Pipe Exposed to Fire Conditions"¹). The discussion demonstrates HDPE pipe with flowing water is resistant to thermal failure.
- 2) For postulated fire exposed HDPE scenarios leading to possible failure, the station flooding response is described below.

HDPE pipe in the Auxiliary Building

During normal plant operations, the installed HDPE piping in the Auxiliary Building is isolated from the RN system. The piping is depressurized and drained. The purpose of the installed HDPE piping in the Auxiliary Building is to support maintenance activities of draining portions of the RN piping. The use of this piping is controlled by normal work control processes. A fire impacting the HDPE in the Auxiliary Building will not contribute to an Auxiliary Building flood during normal operations since the piping is normally isolated and drained.

¹ This calculation was originally referenced in CNS Fire Modeling RAI 01L as the Jensen Hughes Report 25019-RPT-02, Rev. 0 (Thermal Analysis of High Density Polyethylene Pipe Exposed to Fire Conditions)

HDPE pipe in the Turbine and Service Buildings

The HDPE piping in the Service Building and Unit 1 and Unit 2 Turbine Buildings has been installed in minor chemical treatment/water processing systems and the Low Pressure Service Water System (RL). The minor chemical treatment/water processing systems do not pose a significant flooding concern. The RL system is a large flow, large volume system which provides cooling water to several major, non-safety components.

The largest analyzed flooding source in either the Service Building or Turbine Buildings is a break in both units Condenser Cooling Water System (RC). This is discussed in UFSAR Section 10.4.5.3. The RC system does not contain any HDPE piping. However, a failure of the RC system would allow a unit's cooling tower basins content to drain into the unit associated Turbine Building. The adjacent Auxiliary Building is protected from a break in both units RC system by an existing flood wall in the Service Building. This flooding scenario has been analyzed in calculation CNC-1109.04-00-0006 ("Service Building Foundation Material") which established the height of the Service Building flood wall which protects the Auxiliary Building. Equipment important to safe shutdown located in the adjacent Auxiliary Building is protected from either a Service Building or Turbine Buildings flood by the existing flood wall in the Service Building.

Calculation CNC-1109.04-00-0006 also evaluated a single unit loss of RC system which was used to establish the flood wall height protecting the Shared Unit Transformers, SATA and SATB. This is described in the UFSAR in Sections 3.6.1.1.3.2 and 8.3.1.1.1.3.1.

The effects of the flooding scenario induced by the RC system in the Service Building or Turbine Buildings maintain similarities to a flooding scenario from an RL HDPE pipe failure. These similarities provide assurance that the RL HDPE pipe flood would be identified and mitigated within a reasonable period of time by operator action to isolate or shut down the operating RL pumps before the critical flood depth is reached. In the event of a flood from an HDPE pipe failure in the Service Building or Turbine Buildings, the flooding procedure AP/0/A/5500/030 ("Plant Flooding") directs Operations to investigate the source of the flood, and to perform actions necessary to isolate the source of the flooding, including shutdown of the pumps, as needed. These actions ensure any flooding is managed with minimal effect to either unit. The worst case RC system flooding scenarios is bounding for the RL system HDPE pipe failure.