



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

August 23, 2017

Vice President, Operations
Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775

SUBJECT: RIVER BEND STATION, UNIT 1 – STAFF ASSESSMENT OF FLOODING
FOCUSED EVALUATION (CAC NO. MF9899)

Dear Sir or Madam:

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f), "Conditions of Licenses" (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession No. ML111861807). Enclosure 2 to the 50.54(f) letter requested that licensees reevaluate flood hazards for their sites using present-day methods and regulatory guidance used by the NRC staff when reviewing applications for early site permits and combined licenses (ADAMS Accession No. ML12056A046). By letter dated March 12, 2014 (ADAMS Accession No. ML14073A647), Entergy Operations, Inc. (the licensee) responded to this request for River Bend Station, Unit 1 (River Bend).

After its review of the licensee's response, by letter dated September 4, 2015 (ADAMS Accession No. ML15230A010), the NRC issued an interim staff response (ISR) letter for River Bend. The ISR letter provided the reevaluated flood hazard mechanisms that exceeded the current design basis (CDB) for River Bend and parameters that are a suitable input for the mitigating strategies assessment (MSA). As stated in the letter, because the local intense precipitation (LIP) and streams and rivers flood-causing mechanisms at River Bend are not bounded by the plant's CDB, additional assessments of the flood hazard mechanisms are necessary.

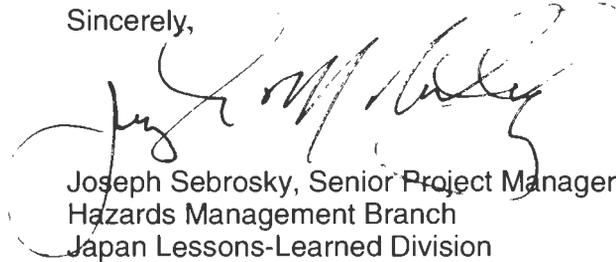
By letter dated June 28, 2017 (ADAMS Accession No. ML17207A105), the licensee submitted the focused evaluation (FE) for River Bend. The FEs are intended to confirm that licensees have adequately demonstrated, for unbounded mechanisms identified in the ISR letter, that: 1) a flood mechanism is bounded based on a reevaluation of flood mechanism parameters; 2) effective flood protection is provided for the unbounded mechanism; or 3) a feasible response is provided if the unbounded mechanism is LIP. The purpose of this letter is to provide the NRC's assessment of the River Bend FE.

As set forth in the attached "Staff Assessment," the NRC staff has concluded that the River Bend FE was performed consistent with the guidance described in Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No.

ML16165A178). NEI 16-05, Revision 1, has been endorsed by Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301). The staff has further concluded that the licensee has demonstrated that effective flood protection exists for the LIP and streams and rivers flood mechanisms during a beyond-design-basis external flooding event at River Bend. This closes out the licensee's response for River Bend for the reevaluated flooding hazard portion of the 50.54(f) letter and the NRC's efforts associated with CAC No. MF9899.

If you have any questions, please contact me at 301-415-1132 or at Joseph.Sebrosky@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph Sebrosky", is written over a circular stamp. The signature is fluid and cursive.

Joseph Sebrosky, Senior Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Enclosure:
Staff Assessment Related to the
Flooding Focused Evaluation for River Bend

Docket No. 50-458

cc w/encl: Distribution via Listserv

STAFF ASSESSMENT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE FOCUSED EVALUATION FOR

RIVER BEND STATION, UNIT 1

AS A RESULT OF THE REEVALUATED FLOODING HAZARD NEAR-TERM TASK FORCE

RECOMMENDATION 2.1 - FLOODING

(CAC NO. MF9899)

1.0 INTRODUCTION

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f) (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession No. ML111861807).

Enclosure 2 of the 50.54(f) letter requested that licensees reevaluate flood hazards for their respective sites using present-day methods and regulatory guidance used by the NRC staff when reviewing applications for early site permits and combined licenses (ADAMS Accession No. ML12056A046). If the reevaluated hazard for any flood-causing mechanism is not bounded by the plant's current design basis (CDB) flood hazard, an additional assessment of plant response would be necessary. Specifically, the 50.54(f) letter stated that an integrated assessment should be submitted, and described the information that the integrated assessment should contain. By letter dated November 30, 2012 (ADAMS Accession No. ML12311A214), the NRC staff issued Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2012-05, "Guidance for Performing the Integrated Assessment for External Flooding."

On June 30, 2015 (ADAMS Accession No. ML15153A104), the NRC staff issued COMSECY-15-0019, describing the closure plan for the reevaluation of flooding hazards for operating nuclear power plants. The Commission approved the closure plan on July 28, 2015 (ADAMS Accession No. ML15209A682). COMSECY-15-0019 outlines a revised process for addressing cases in which the reevaluated flood hazard is not bounded by the plant's CDB. The revised process describes a graded approach in which licensees with hazards exceeding their CDB flood will not be required to complete an integrated assessment, but instead will perform a focused evaluation (FE). As part of the FE, licensees will assess the impact of the hazard(s) on their site and then evaluate and implement any necessary programmatic, procedural, or plant modifications to address the hazard exceedance.

Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16165A178), has been endorsed by the NRC as an appropriate methodology for licensees to perform the focused evaluation in response to the 50.54(f) letter. The NRC's endorsement of NEI 16-05, including exceptions, clarifications, and additions, is described in NRC JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301).

Therefore, NEI 16-05, Revision 1, describes acceptable methods for demonstrating that River Bend Station, Unit 1 (River Bend) has effective flood protection.

2.0 BACKGROUND

This provides the final NRC staff assessment associated with the information that the licensee provided in response to the reevaluated flooding hazard portion of the 50.54(f) letter. Therefore, this background section includes a summary description of the reevaluated flood information provided by the licensee and the associated assessments performed by the NRC staff. The reevaluated flood information includes: 1) the flood hazard reevaluation report (FHRR); 2) the mitigation strategies assessment (MSA); and 3) the FE.

Flood Hazard Reevaluation Report

By letter dated March 12, 2014 (ADAMS Accession No. ML14073A647), Entergy Operations, Inc. (Entergy, the licensee) responded to the 50.54(f) request for River Bend and submitted the FHRR. After the review of the licensee's response, by letter dated September 4, 2015 (ADAMS Accession No. ML15230A010), the NRC issued an interim staff response (ISR) letter for River Bend. The ISR letter provided the reevaluated flood hazard mechanisms that exceeded the CDB for River Bend and parameters that are a suitable input for the MSA. As stated in the letter, because the local intense precipitation (LIP) and streams and rivers flood-causing mechanisms at River Bend are not bounded by the plant's CDB, additional assessments of the flood hazard mechanisms were necessary. The NRC staff issued a final staff assessment of the FHRR by letter dated August 31, 2016 (ADAMS Accession No. ML16204A207). The NRC staff's conclusion regarding LIP and streams and rivers flood-causing mechanisms exceeding the CDB remained unchanged from the information in the ISR letter.

Mitigation Strategies Assessment

By letter dated October 24, 2016 (ADAMS Accession No. ML16302A158), Entergy submitted the MSA for River Bend for review by the NRC staff. The MSAs are intended to confirm that licensees have adequately addressed the reevaluated flooding hazards within their mitigation strategies for beyond-design-basis external events. By letter dated May 2, 2017 (ADAMS Accession No. ML17075A059), the NRC issued its assessment of the River Bend MSA. The NRC staff concluded that the River Bend MSA was performed consistent with the guidance described in Appendix G of NEI 12-06, Revision 2, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" (ADAMS Accession No. ML16005A625). The NRC's endorsement of NEI 12-06, Revision 2, is described in JLD-ISG-2012-01, Revision 1, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15357A163). The NRC staff further concluded that the licensee has demonstrated that the mitigation strategies, if appropriately implemented, are reasonably protected from reevaluated flood hazards conditions for beyond-design-basis external events.

Focused Evaluation

By letter dated June 28, 2017 (ADAMS Accession No. ML17207A105), the licensee submitted the FE for River Bend. The FEs are intended to confirm that licensees have adequately demonstrated, for unbounded mechanisms identified in the ISR letter, that: 1) a flood mechanism is bounded based on further reevaluation of flood mechanism parameters; 2) effective flood protection is provided for the unbounded mechanism; or 3) a feasible response is provided if the unbounded mechanism is local intense precipitation. These 3 options associated with performing an FE are referred to as Path 1, 2, or 3, as described in NEI 16-05,

Revision 1. The purpose of this staff assessment is to provide the results of the NRC's evaluation of the River Bend FE.

3.0 TECHNICAL EVALUATION

As described in the ISR letter, the LIP and streams and rivers flooding mechanisms were found to exceed the plant's CDB flood at River Bend, and were addressed by Entergy in the River Bend FE. Entergy stated that its FE followed Path 2 of NEI 16-05, Revision 1 and utilized Appendix B for guidance on evaluating the site strategy. Associated effects (AE) and flood event duration (FED) parameters were assessed by Entergy and have already been reviewed by the NRC, as summarized by letter dated May 2, 2017 (ADAMS Accession No. ML17075A059).

The FE credits passive protection features to demonstrate that key structures, systems, and components (SSCs) are protected from the LIP and streams and rivers flooding mechanisms. The key SSCs are located in flood protected areas or are situated at a minimum elevation of 98 feet (ft.) mean sea level (MSL). For LIP, the maximum flood elevation is 98.3 ft. MSL. The licensee credits three doors in the FE that are also referenced in the FHRR to ensure key SSCs are not impacted. These doors are maintained closed and sealed during normal operations. The River Bend streams and rivers flooding mechanisms include the West Creek probable maximum flood (PMF) and the Mississippi River PMF. The maximum flood elevations for the West Creek PMF and Mississippi River PMF are 95.1 ft. MSL and 59.7 ft. MSL, respectively. Therefore, both of the stream and river PMF mechanisms are below the 98 ft. MSL minimum elevation level of key SSCs.

3.1 Evaluation of Flood Impact Assessment for LIP

3.1.1 Description of Impact of Unbounded Hazard

The River Bend FE identified the potential impacts to key SSCs as a result of water ingress due to LIP. The LIP floodwater elevation of 98.3 ft. exceeds the minimum protection elevation of 98 ft. MSL in two areas at the River Bend site, but do not inundate SSCs important to safety. Figure 3.1.1-1 and Figure 3.1.1-2 of this document provide the location of Doors CB-098-17, CB-098-014, AB-098-03, and AB-098-04 that the licensee credits for its conclusion that the LIP event does not inundate SSCs important to safety. These doors are located in the corridor between the control building and auxiliary building where LIP elevations are above 98 ft. MSL.

3.1.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

The licensee relies on passive features and existing doors to justify that there is still margin available using a deterministic approach. The staff notes that the LIP analysis is conservative and results in 0.3 ft. of flood waters above the 98 ft. MSL minimum elevation level of key SSCs. The licensee stated in its FE that several conservative assumptions are used in the LIP analysis. The staff concludes that the calculated elevation for LIP is acceptable based on guidance found in NEI 16-05, Revision 1, Appendix B Section B.1, "Determination of Adequate Available Physical Margin," because of the following conservative assumptions used in the River Bend LIP analysis:

- Small openings in the vehicle barrier system were assumed to be blocked, thus reducing the ability to drain portions of the site during a LIP event; and
- The site drainage network was assumed to be non-functional. Culverts were considered to be blocked and storm sewers were not considered.

Reliability of Flood Protection Features

In its FE, the licensee notes that ponding up to 0.3 ft. will occur outside door CB-098-014 after leaking through door CB-098-17. The licensee's FHRR dated March 12, 2014, expands on the discussion of these doors and notes that flood waters penetrating Door CB-098-17 would potentially inundate and penetrate Doors CB-098-016 and CB-098-015. Water penetrating through Door CB-098-16 will enter the bottom of a stairwell, with no impact to SSCs important to safety. Water penetrating Door CB-098-15 will flow into an elevator shaft, with no impact to SSCs important to safety, and would pond against Door CB-098-14, which provides access to SSCs important to safety. The interior area that would be inundated due to leakage through Door CB-098-17 is highlighted in blue in Figure 3.1.1-2.

Door CB-098-014 is a watertight door in accordance with River Bend procedures and is designed to withstand 28 ft. head of water from either side of the door. The staff performed an audit of Specification No. 210.462, Revision 1, "Pressure-tight and Watertight Doors," in accordance with the NRC staff's audit plan dated July 18, 2017 (ADAMS Accession No. ML17192A452), to confirm the criteria used for the design of Door CB-098-014. The staff confirmed that the specification states that watertight doors shall be designed to withstand a 28 ft. head of water from either side of the doors. The specification also states that each watertight door shall be furnished with a compressible gasket designed so that the entire door and frame assembly shall be watertight when the door is closed and subjected to the hydrostatic head.

The staff also audited River Bend model work order 50351354 for inspection of the Mosler-Type control building doors dated December 10, 2009, and work order package 00234024, "Inspect the Mosler Type Control Building Doors," dated February 11, 2011. The model work order package 50351354 provides the general guidance for developing the specific work order packages for the periodic inspection of control building doors. The periodicity for the control building door inspections is every 8 years (4 outages). The last inspection of Door CB-098-14 was performed in January of 2011, as documented in work order package 00234024, and included an inspection of the door seals to ensure the seals could perform their flood protection function. The staff concludes that the licensee has procedures in place to ensure that door CB-098-014 is maintained and operated so that the leak tight function of this door is reasonably assured.

Based on this door being designed to withstand 28 ft. head of water and experiencing 0.3 ft. head of water due to a LIP event and the procedures the licensee has in place to maintain the leak-tight function of Door CB-098-014, the staff concludes that this door meets the definition of being reliable to maintain key safety functions found in Appendix B of NEI 16-05, Revision 1.

The licensee's March 12, 2014, FHRR notes that Doors AB-098-03 and AB-098-04 are credited for missile protection and are designed to be airtight to a pressure differential of 3.8 pounds per square inch. In its FE, the licensee performed an evaluation of these doors to provide a flood barrier. The licensee calculated that the maximum leakage rate for doors AB-098-03 and AB-098-04 are 0.72 gallons per minute (gpm) and 1.4 gpm, respectively. The licensee calculated that based on the leakage rates and the door hydrographs the total leakage into the Auxiliary Building is estimated to be 630 gallons, which is within the capabilities of the minimum capacity of 650 gallons of two sump tanks to which the leakage would be directed. The licensee based the minimum capacity of the sump tanks based on procedures that are in place to control the sump tank levels at a maximum of 32 inches.

The staff audited calculation EC 49418, Rev. 0, "Evaluate Doors AB-098-03 and AB-098-04 as Watertight During a Local Intense Precipitation (LIP) to Support Fukushima Flood Reevaluation," dated March 7, 2014, in accordance with the NRC staff's audit plan dated

July 18, 2017. The calculation evaluated the air-tight design parameters of doors AB0098-03 and AB098-04 and applied it to the reevaluated flood parameters postulated during a LIP to determine if the doors will provide an adequate flood barrier. The calculation compared these missile barrier doors against doors that were procured to be watertight doors. The comparison included a review of the door thickness, hinge pin size, and latch-bolt size to determine if the doors could withstand the hydrostatic loads from the LIP event. As stated above, the calculation also included a numerical estimation of the water leak rate past the gasket based on these doors being designed to have air leakage rates not exceeding 20 cubic feet per minute. The licensee's calculation concludes that doors AB098-03 and AB098-04 will adequately function as flood barriers under the beyond-design-basis conditions associated with the LIP reevaluated flood hazard. The staff concludes that the calculations' assumptions and conclusions are reasonable and that it is realistic to assume that these doors, although not leak tight, will minimize water ingress such that key safety functions will be ensured in the event of a beyond-design-basis LIP event at the site.

The staff also audited River Bend model work order 50038137 for inspection maintenance of the auxiliary building doors dated December 10, 2009, and work order package 52497667, "Perform Maintenance on the Peele Type Secondary Containment Doors," dated April 26, 2017. The model work order package 50038137 provides the general guidance for developing the specific work order packages for the periodic inspection of auxiliary building doors. The periodicity for the auxiliary building door inspections is every 4 years. The last inspection of Doors AB-098-03 and AB-098-04 was performed in January/February of 2017, as documented in work order package 52497667, and included an inspection of the door seals to ensure the seals could perform their missile protection function. The staff concludes that the licensee has procedures in place to ensure that Doors AB-098-03 and AB-098-04 are maintained and operated so that the missile protection function of these doors, which in accordance with the staff's conclusion above will limit water ingress, is reasonably assured.

Based on the design of Doors AB-098-03 and AB-098-04, the capability of the plant's sumps to contain the leakage past these doors in the event of a LIP, and the procedures the licensee has in place to maintain the leak performance characteristics of these doors, the staff concludes that these doors are reliable to maintain key safety functions as described in Appendix B of NEI 16-05, Revision 1.

Section 2.3 of the licensee's FHRR states that the safety-related equipment is located in buildings protected against floodwater entry or at a minimum elevation of 98 ft. MSL. The staff's review of the openings above 98 ft. is documented above. In NEI 16-05, Revision 1, Section B.2.1.5 states the guidance prepared for the flooding design-basis walkdowns performed in response to NTF Recommendation 2.3 can be used for purposes of evaluating the adequacy of plugs and penetration seals by substituting the reevaluated flood parameters for the licensing basis parameters where appropriate. The River Bend flooding walkdowns were performed in accordance with the March 12, 2012, 50.54(f) letter to verify that plant features credited in the current licensing basis for protection and mitigation from external flood events are available, functional, and properly maintained.

Entergy documented the results of the flooding walkdown in a letter dated November 27, 2012 (ADAMS Accession No. ML123400067). The staff's assessment of the River Bend flooding walkdown report is documented in a letter dated June 20, 2014 (ADAMS Accession No. ML14148A150). As documented in the walkdown report, all penetrations, doors, and equipment hatches through the exterior walls of Seismic Category I structures below the design-basis flood height of 96 ft. MSL have watertight seals. Walkdowns were performed of all exterior walls, roofs, and foundation mats of Seismic Category I structures at or below 96 ft. MSL. Conditions that did not meet the acceptance criteria were entered into the corrective action program. The walkdown report notes that all flood barriers and seal structures were determined to be within

the scope of the Maintenance Rule (10 CFR 50.65) and are therefore examined in accordance with Entergy's procedures used to demonstrate compliance with the rule.

In a January 27, 2014, update to the flooding walkdown report (ADAMS Accession No. ML14042A161), the licensee stated that the walkdowns also included consideration of the available physical margin at the plant. By including the available physical margin the licensee's walkdown also evaluated the current licensing basis minimum protection of 98 ft. MSL, which is beyond the current design-basis of 96 ft. MSL. The staff audited a sample of the walkdown reports in accordance with the NRC staff's audit plan dated July 28, 2017, to confirm that the walkdowns were performed and assessed to 98 ft. MSL. Specifically, the staff audited the walkdown report for the auxiliary building south wall below elevation 96 ft. and applicable portions of the D tunnel. The walkdown package dated October 23, 2012, documents a 2 ft. available physical margin above the 96 ft. MSL elevation for which flood features were assessed. Based on the audit of sample walkdown reports the staff concludes that the licensee's walkdowns considered and evaluated flood protection features to 98 ft. MSL. Therefore, the staff concludes that River Bend meets the guidance of NEI 16-05, Revision 1, Section B.2.1.5 and that the adequacy of plugs and penetration seals to 98 ft. MSL has been adequately addressed.

Because increased focus has been placed on flood protection since the accident at Fukushima, licensees and NRC inspectors have identified deficiencies with equipment, procedures, and analyses relied on to either prevent or mitigate the effects of external flooding at a number of licensed facilities. Recent examples include those found in Information Notice 2015-01, "Degraded Ability to Mitigate Flooding Events" (ADAMS Accession No. ML14279A268). In addition, the NRC is cooperatively performing research with the Electric Power Research Institute to develop flood protection systems guidance that focuses on flood protection feature descriptions, design criteria, inspections, and available testing methods in accordance with a memorandum of understanding dated September 28, 2016 (ADAMS Accession No. ML16223A495). The NRC staff expects that licensees will continue to maintain flood protection features in accordance with their current licensing basis. The NRC staff further expects that continued research involving flood protection systems will be performed and shared with licensees in accordance with the guidance provided in Management Directive 8.7, "Reactor Operating Experience Program" (ADAMS Accession No. ML122750292), as appropriate.

Based on the staff's evaluation of flood protection features both below 98 ft. MSL and above 98 ft. MSL, the staff concludes that these features are reliable to maintain key safety functions as defined in Appendix B of NEI 16-05, Rev 1.

3.1.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the beyond-design-basis LIP event. As described above, the licensee's evaluation relied on passive existing flood protection features to demonstrate adequate flood protection. Therefore, there is no need to review overall site response.

3.2 Evaluation of Flood Impact Assessment for Streams and Rivers Flooding

3.2.1 Description of Impact of Unbounded Hazard

As described in the FE, the West Creek PMF the maximum flood elevation is 95.1 ft. MSL and the Mississippi River PMF peak flood elevation is 59.7 ft. MSL. Protection of key SSCs is provided by site grade and building exterior features, which are permanent and passive.

3.2.2 Evaluation of Available Physical Margin

The available physical margin (APM) for the Mississippi River PMF is greater than 35 ft. in relation to the design-basis flood height of 96 ft. MSL. The staff concludes that this APM is acceptable because it meets the guidance found in NEI 16-05, Revision 1. Section B.1, which states that a standard used to support Federal Emergency Management Agency flood insurance studies can be used to define "adequate APM" for the river flood as 2.5 ft.

The APM for the West Creek PMF is 2.9 ft. below the 98 ft. MSL for which key SSCs are above or for which flood protection exists and 0.9 ft. below the design-basis flood height for the plant. The licensee stated that the following conservative assumptions were included in the West Creek PMF calculation:

- Culverts on West Creek under the access road are assumed to be completely blocked by debris and bridges and culverts upstream of River Bend were conservatively ignored; and
- The Louisiana State Highway 10 Bridge over Grants Bayou was conservatively assumed to be 50 percent blocked by debris. All other bridges downstream of River Bend on Grants Bayou were conservatively assumed to be completely blocked by debris. The Louisiana State Highway 10 Bridge is over 1,000 ft. long and has an opening that is more than 50 ft. high at the centerline of the channel. Significant debris blockage of the bridge is unlikely due to the large size of the bridge opening. Bridges and culverts upstream of River Bend were conservatively ignored.

NEI 16-05, Revision 1, Appendix B provides guidance that negligible or zero APM can be justified if the use of conservative inputs, assumptions, and/or methods in the flood hazard reevaluation can be established. Based on the above conservative assumptions, the staff concludes that River Bend APM for the West Creek PMF is acceptable. The staff further concludes that the River Bend West Creek PMF APM is acceptable for the following reasons:

- The 95.1 ft. MSL West Creek PMF is below the 96 ft. design-basis flood height for the plant. Section 3.1 of this document describes the staff's assessment of the River Bend flood protection measures for the 96 ft. MSL design-basis flood height. These flood protection measures were verified in accordance with the flooding walkdowns that were performed at River Bend; and
- The 95.1 ft. MSL West Creek PMF is below the 98.3 ft. MSL LIP flood elevation. Section 3.1 of this document provides the staff's assessment of the flood protection measures in place for the 98.3 ft. MSL LIP event, which the staff finds acceptable.

3.2.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the beyond-design-basis streams and rivers event. As described above, the licensee's evaluation relied on passive existing features to demonstrate adequate flood protection. Therefore, there is no need to review overall site response.

4.0 AUDIT REPORT

The July 18, 2017, generic audit plan describes the NRC staff's intention to issue an audit report that summarizes and documents the NRC's regulatory audit of the licensee's FE. The NRC staff's River Bend audit was limited to the review of the calculations, procedures, and walkdown package described above. Because this staff assessment appropriately summarizes the results

of the audit, the NRC staff concludes a separate audit report is not necessary, and that this document serves as the audit report described in the NRC staff's July 18, 2017, letter.

5.0 CONCLUSION

The NRC staff concludes that Entergy performed the River Bend FE in accordance with the guidance described in NEI 16-05, Revision 1, as endorsed by JLD-ISG-2016-01, and that the licensee has demonstrated that effective flood protection exists from the reevaluated flood hazards. Furthermore, the NRC staff concludes that River Bend screens out of performing an integrated assessment based on the guidance found in JLD-ISG-2016-01. As such, in accordance with Phase 2 of the process outlined in the 50.54(f) letter, additional regulatory actions associated with the reevaluated flood hazard, beyond those associated with mitigation strategies assessment, are not warranted. The licensee has satisfactorily completed providing responses to the 50.54(f) activities associated with the reevaluated flood hazards.

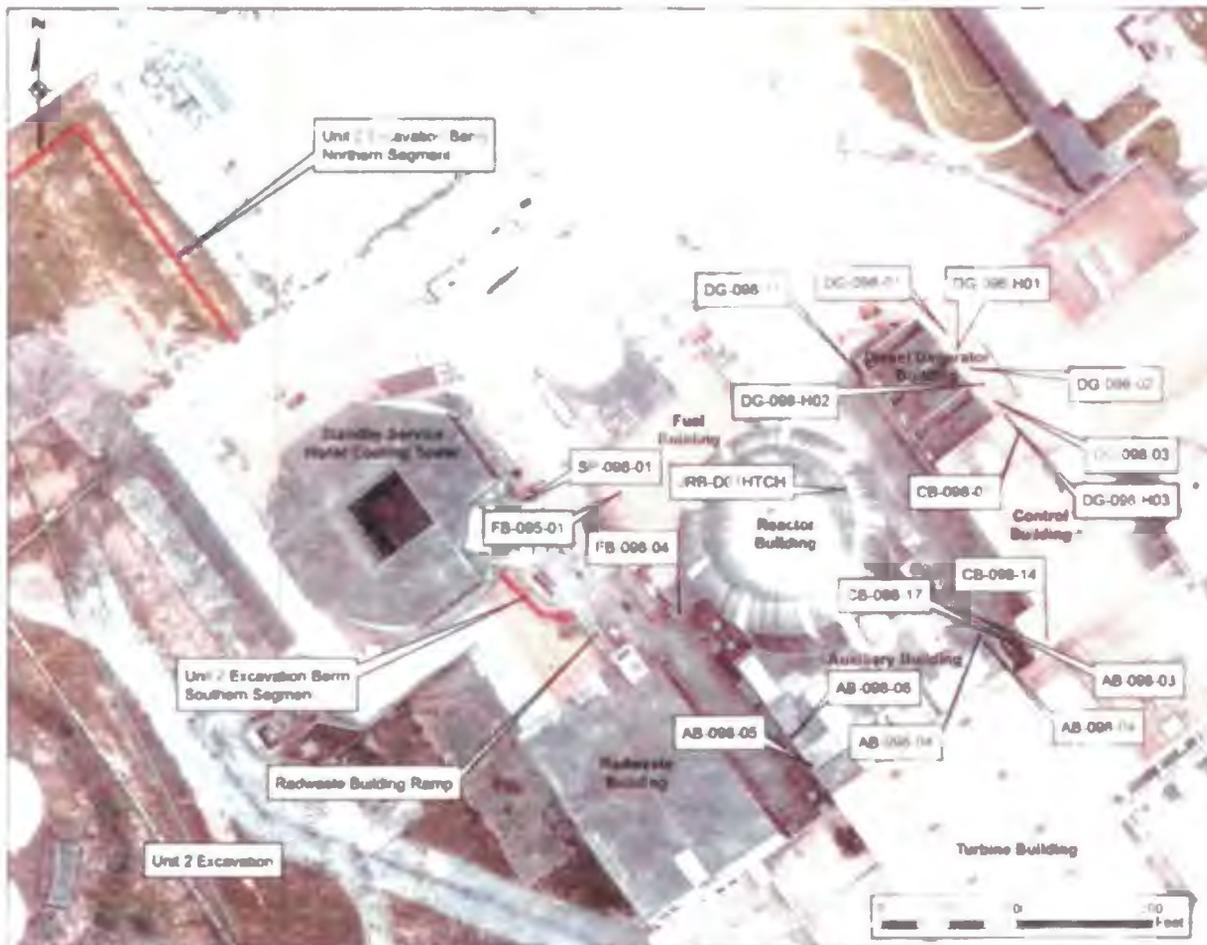


Figure 3.1-1 River Bend Door Locations (Adapted from Figure 3.1-3 of March 12, 2014, FHRR (ADAMS Accession No. ML14073A647))

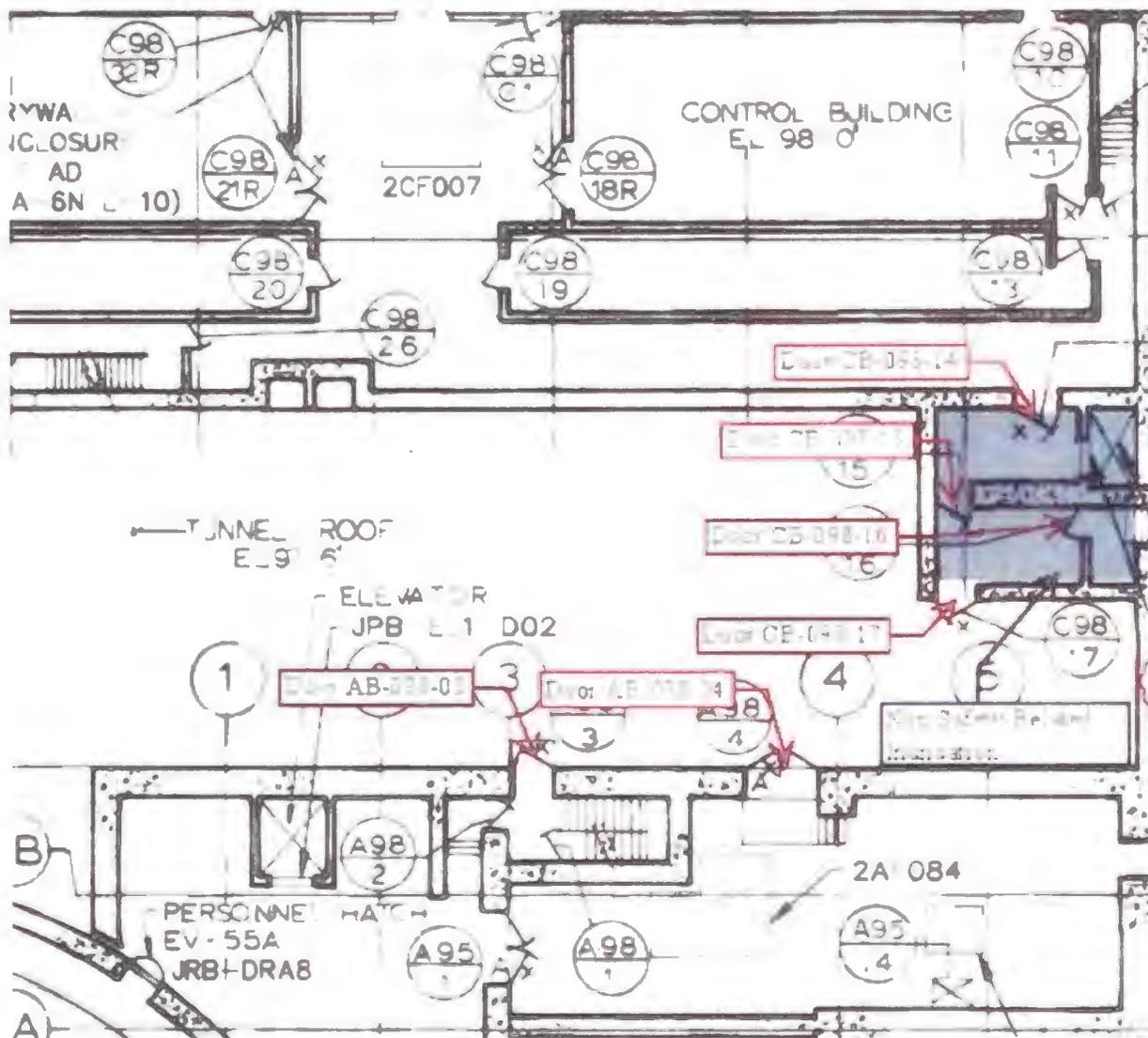


Figure 3.1.1-2 Critical Door Layout (Adapted from Figure 5.1-2 of March 12, 2014, FHRR)

RIVER BEND STATION, UNIT 1 – STAFF ASSESSMENT OF FLOODING FOCUSED
EVALUATION AUGUST 23, 2017

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