



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

August 1, 2017

Mr. William F. Maguire
Site Vice President
Entergy Operations, Inc.
River Bend Station
5485 US Highway 61N
St. Francisville, LA 70775

**SUBJECT: RIVER BEND STATION - INSPECTION OF THE IMPLEMENTATION OF
MITIGATION STRATEGIES AND SPENT FUEL POOL INSTRUMENTATION
ORDERS AND EMERGENCY PREPAREDNESS COMMUNICATION/
STAFFING/ MULTI-UNIT DOSE ASSESSMENT PLANS – INSPECTION
REPORT 05000458/2017008**

Dear Mr. Maguire:

On July 20, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your River Bend Station. On July 20, 2017, the NRC inspectors discussed the results of this inspection with Mr. W. Maguire, Site Vice President, and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication, Staffing, and Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel. No findings were identified.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public

W. Maguire

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Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Jason W. Kozal, Chief
Project Branch C
Division of Reactor Projects

Docket No. 50-458
License No. NPF-47

Enclosure:
Inspection Report 05000458/2017008
w/ Attachment: Supplemental Information

cc w/encl: Electronic Distribution

**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket: 50-458
License: NPF-47
Report: 05000458/2017008
Licensee: Entergy Operations, Inc.
Facility: River Bend Station
Location: 5485 U.S. Highway 61N
St. Francisville, LA 70775
Dates: May 22 through July 20, 2017
Inspectors: J. Mateychick, Team Lead, Sr. Reactor Inspector, Region IV
J. Sowa, RBS Senior Resident Inspector
M. Stafford, Project Engineer, Region IV
J. Hickey, Senior Technical Advisor For Reactor Systems, NRR/DSS
Approved By: Jason W. Kozal
Chief, Project Branch C
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000458/2017008; 05/22/2017 – 07/20 /2017; River Bend Station; Temporary Instruction 2515/191, Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans issued December 23, 2015

The inspection covered a one week inspection by two inspectors from the Region IV office, one inspector from the Office of Nuclear Reactor Regulation and one of the assigned resident inspectors. No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

A. NRC-Identified and Self-Revealing Findings

None

B. Licensee-Identified Violations

None

REPORT DETAILS

4. Other Activities

40A5 Other Activities (TI 2515/191)

The objective of Temporary Instruction (TI) 2015/191, "Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans," is to verify that licensees have adequately implemented the mitigation strategies as described in the licensee's Final Integrated Plan, "[Completion of Required Action by NRC Order EA-12-049, Issuance of Order to Modify Licenses With Regard To Requirements for Mitigation Strategies for Beyond-Design-Basis External Events - River Bend Station, Unit 1](#) (ADAMS Accession No. ML15279A345)," and the NRC's plant safety evaluation, "[River Bend Station, Unit 1 - Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Instrumentation Related to Orders EA-12-049 and EA-12-051](#) (ADAMS Accession No. ML15292A508)," and to verify that the licensee installed reliable water-level measurement instrumentation in their spent fuel pools. The purpose of this TI is also to verify the licensees have implemented Emergency Preparedness (EP) enhancements as described in their site-specific submittals and NRC safety assessments, including multi-unit dose assessment capability and enhancements to ensure that staffing is sufficient and communications can be maintained during such an event.

The inspection verifies that plans for complying with NRC Orders EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (ADAMS Accession No. ML12229A174)," and EA-12-051, "Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS Accession No. ML12056A044)," are in place and are being implemented by the licensee. Additionally, the inspection verifies implementation of staffing and communications information provided in response to the March 12, 2012, request for information letter and multiunit dose assessment information provided per COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned, dated March 27, 2013 (ADAMS Accession No. ML12339A262)."

The team discussed the plans and strategies with plant staff, reviewed documentation, and where appropriate, performed plant walkdowns to verify that the strategies could be implemented as stated in the licensee's submittals and the NRC staff prepared safety evaluation. For most strategies, this included verification that the strategy was feasible, procedures and/or guidance had been developed, training had been provided to plant staff, and required equipment had been identified and staged. Specific details of the team's inspection activities are described in the following sections.

1. Mitigation Strategies for Beyond-Design-Basis External Events

a. Inspection Scope

The team examined the licensee's established guidelines and implementing procedures for the beyond-design-basis mitigation strategies. The team assessed how the licensee coordinated and documented the interface/transition between

existing off-normal and Emergency Operating Procedures with the newly developed mitigation strategies. The team selected a number of mitigation strategies, conducted plant walkdowns with licensed operators and responsible plant staff, to assess the adequacy and completeness of the procedures; familiarity of operators with the procedure objectives and specific guidance; staging and compatibility of equipment; and the practicality of the operator actions prescribed by the procedures, consistent with the postulated scenarios.

The team verified that a preventive maintenance program had been established for the FLEX portable equipment and that periodic equipment inventories were in place and being conducted. Additionally, the team examined the introductory and planned periodic/refresher training provided to the Operations and Fire Protection staffs most likely to be tasked with implementation of the FLEX mitigation strategies. The team also reviewed the introductory and planned periodic training provided to the Emergency Response Organization personnel. Documents reviewed are listed in the attachment.

b. Assessment

Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittals and the associated safety evaluation, and determined that the licensee is generally in compliance with NRC Order EA-12-049. The inspectors verified that the licensee satisfactorily:

- Developed and issued FLEX Support Guidelines (FSG) to implement the FLEX strategies for postulated external events;
- Integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs are clear when using existing plant procedures;
- Protected FLEX equipment from site-specific hazards;
- Developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
- Trained their staff to assure personnel proficiency in the mitigation of beyond-design-basis events; and
- Developed means to ensure that the necessary off-site FLEX equipment will be available from off-site locations.

The inspectors verified that non-compliances with current licensing requirements and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings identified.

2. Spent Fuel Pool (SFP) Instrumentation

a. Inspection Scope

The team examined the licensee's newly installed spent fuel pool instrumentation. Specifically, the inspectors verified the sensors were installed as described in the plant specific submittals and the associated safety evaluation, and that the cabling for the power supplies and the indications for each channel are physically and electrically separated. Additionally, environmental conditions and accessibility of the instruments were evaluated. Documents reviewed are listed in the attachment.

b. Assessment

Based on samples selected for review, the inspectors determined that the licensee satisfactorily installed and established control of the spent fuel pool instrumentation as described in the plant specific submittals and the associated safety evaluation, and determined that the licensee is generally in compliance with NRC Order EA-12-051. The inspectors verified that the licensee satisfactorily:

- i. Installed the SFP instrumentation sensors, cabling, and power supplies to provide physical and electrical separation as described in the plant specific submittal and safety evaluation;
- ii. Installed the SFP instrumentation display in the location, environmental conditions, and accessibility as described in the plant specific submittals; and
- iii. Trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation.

The inspectors verified that non-compliances with current licensing requirements and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings identified.

3. Staffing and Communication Request for Information

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns the team verified that the licensee has implemented required changes to staffing, communications equipment, and facilities to support an Extended Loss of All AC Power (ELAP) scenario as described in the licensee's staffing assessment and the NRC safety assessment. The team also verified that the licensee has implemented dose assessment (including releases from spent fuel pools) capability using the licensee's site-specific dose assessment software and approach as described in the licensee's dose assessment submittal. Documents reviewed are listed in the attachment.

b. Assessment

The inspectors reviewed information provided in the licensee's multiunit dose submittal and in response to the NRC's March 12, 2012, request for information letter, and verified that the licensee satisfactorily implemented enhancements pertaining to, "Near-Term Task Force Recommendation 9.3," response to a large scale natural emergency event that results in an extended loss of all ac power to the site and impedes access to the site.

The inspectors verified the following:

- Licensee satisfactorily implemented required staffing change(s) to support an ELAP scenario;
- Emergency preparedness communications equipment and facilities are sufficient for dealing with an ELAP scenario; and
- Implemented dose assessment capabilities (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

The inspectors verified that non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings identified.

40A6 Meetings, Including Exit

Exit Meeting Summary

On May 26, 2017, the inspectors presented the on-site inspection results in a management debrief to Mr. M. Chase, Director-Regulatory and Performance Improvement, and other members of the site staff.

The inspectors completed an exit meeting with Mr. W. Maguire, Site Vice President, and other members of the site staff, via telephone on July 20, 2017, who acknowledged the final results of the inspection. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Browning, Training Instructor
D. Bottemiller, Contractor, FLEX Project
M. Chase, Director, Regulatory & Performance Improvement
D. Cupstid, Contractor, FLEX Project
R. Findish, Supervisor, Engineering
K. Huffstatler, Senior Licensing Specialist
F. Hurst, Manager, Emergency Planning
W. Maguire, Site Vice President
S. Martin, Supervisor, Engineering Projects
R. Melton, Operations Shift Manager
S. Peterkin, Manager, Radiation Protection
J. Reynolds, Senior Manager, Operations
A. Riegert, FLEX Marshall
J. Rogers, Supervisor, Engineering
D. Sandlin, Director, Design Engineering
T. Schenk, Manager, Regulatory Assurance
N. Tison, Senior Emergency Planner
S. Vazquez, Director, Engineering
C. Williamson, Senior Licensing Specialist

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

2515/191	TI	Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans
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LIST OF DOCUMENTS REVIEWED

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-143	Standby Battery ENB-BAT01B Duty Cycle, Current Profile and Size Verification-Markup EC45120	11
E-144	Standby Battery ENB-BAT01B Duty Cycle, Current Profile and Size Verification-Markup EC45120	7
EC 44962	FLEX Storage Buildings	0
EC 44692, Attachment 6.002	FLEX Debris Removal Assessment for River Bend Station	0
ECN 52452	FLEX Storage Buildings As-Built ECN	
EC 62532	FLEX Storage Building Updates Base on Seismic Report from NRC	0
G13.18.3.6*021	DC System Analysis, Methodology & Scenario Development-Markup EC45120	1

Condition Reports

CR-RBS-2017-04192*	CR-RBS-2017-04190*	CR-RBS-2017-04189*
CR-RBS-2017-04159*	CR-RBS-2017-04092*	CR-RBS-2017-04089*
CR-RBS-2017-04072*	CR-RBS-2017-04065*	CR-RBS-2017-03939
CR-RBS-2017-03939	CR-RBS-2017-03854	CR-RBS-2017-00019
CR-RBS-2017-02121	CR-RBS-2017-02940	CR-RBS-2017-03989
CR-RBS-2017-04214*	CR-RBS-2017-04226*	CR-RBS-2017-04269*
CR-RBS-2017-04270*	CR-RBS-2016-04034	

*Issued as a result of inspection activities.

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EA-006J	Door Location Plan Sheet 1	6
EA-006K	Door Location Plan Sheet 2	6
EA-006L	Door Location Plan Sheet 3	5
EA-006M	Door Location Plan Sheet 4	7
EP-108G	Tunnel Piping Plan South of STBY Cooling TWR 1	8

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
PID-09-15B	Engineering P&I Diagram System 659 Makeup Water System	21

<u>Miscellaneous Documents</u>		
<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EC 44962	FLEX Equipment Storage Buildings	0
EC 57113	Safer Response Plan for River Bend Station	0
EC 62532	FLEX Storage Building Updates Base on Seismic Report for NRC	0
EN-OP-201-07	River Bend Station FLEX Program Document	0
EN-OP-202	Diverse and Flexible Coping Strategies (FLEX) Program Document Bases	0
EN-TQ-110-01	Fleet EPlan Training Course Summary	3
Engineering Report RBS-CS-13-00007	Evaluation of the Suppression Pool Cleanup (SPC) System Components Credited for FLEX Implementation to Function Following a Seismic Event	0
Entergy Letter EP-M-15-011	Team A Site Drill	June 25, 2015
Entergy Letter EP-M-15-015	ERO Team "B" Site Drill	August 11, 2015
Entergy Letter EP-M-15-018	ERO Team "C" Site Drill	October 12, 2015
Entergy Letter RBG-47570	Completion of Required Action by NRC Order EA-12-051 Reliable Spent Fuel Pool Level (SFP) Instrumentation, River Bend Station - Unit 1	May 18, 2015
Entergy Letter RBG-47618	Completion of Required Action by NRC Order EA-12-049, Issuance of Order to Modify Licenses With Regard To Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, River Bend Station - Unit 1	November 29, 2015

<u>Miscellaneous Documents</u>		
<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
Entergy Letter RBG-4718	Mitigating Strategies Assessment (MSA) for Flooding River Bend Station – Unit 1	October 24, 2016
FCBT-ERTD-FLEX- ADVANCED	Generic Advanced FLEX Training Course	0
FCBT-ERTD-FLEX- INITIAL	Generic Basic FLEX Training Course	0
FQC-ICT3-MOHR-02	Maintain the MOHR SFP-1 Probe Assembly	0
FLP-ICT3-SFPLMS	MOHR Spent Fuel Pool Level Monitoring System	1
LO-HQNLO-2014- 0056	Phase 2 Communications Assessment	0
NSRC-005	Safer Response Plan for River Bend Station	2
NRC Letter ML15292A508	River Bend Station, Unit 1 - Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Instrumentation Related to Orders EA-12-049 and EA-12-051 (CAC Nos. MF0952 and MF0953)	August 11, 2016
RCBT-GEN-FLEX002	FLEX Overview Gap Training	0
RGAT-RPCT-FLEX	RP Overview of FLEX Systems	0
RLP-GEN-FLEX001	Diverse and Flexible Coping Strategies (FLEX) Overview	0
RLP-GM-ERO	General Maintenance ERO Training	2
RLP-GM-FLEXERO	FLEX Response Gap Training	0
RPF-GM-FLEXERO-1	Transfer FLEX Equipment Practical	0
RDRL-EP-1501	Site Drill Scenario	1
RDRL-EP-1502	Site Drill Scenario	0
RDRL-EP-1503	Site Drill Tabletop Scenario	0

<u>Miscellaneous Documents</u>		
<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
TR 3.13.1	Technical Requirements Manual – Spent Fuel Pool Instrumentation	138
TR 3.13.2	Technical Requirements Manual – Diverse and Flexible Coping Strategies (FLEX) Equipment	141
TR 3.13.3	Technical Requirements Manual – FLEX Fluid and Electrical Connection Components	141
TR 3.13.4	Technical Requirements Manual – Plant FLEX Support Equipment	141
1-0530-1	MOHR SFPI Installation Checklist River Bend B	2.1
1-0530-1	MOHR SFPI Installation Checklist River Bend A	2.1
	Entergy River Bend Station FLEX Validation	April 9, 2015
	FLEX Haul Path Images	
	FLEX Training Basis	
	LM-0311 Qual Matrix	
	Memorandum of Understanding Between Entergy Nuclear Operations Inc., the Louisiana Governor’s Office of Homeland Security and the Louisiana National Guard	March 2015
	Report on Emergency Response Training Development	2014
	River Bend Station On-Shift Analysis Final Report	0
	River Bend Station NEI 12-01 Phase 2 Staffing Assessment	1
	Self-Assessment in preparation for NRC FLEX Inspection	April 27, 2017

Modifications

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 44959	Internal Flooding Evaluation for Code Class 4 (Non-Safety Related) Tunnels Pipelines at River Bend Station	1
EC44964	SFP Level instruments (Parent)	0
EC45120	FLEX D/C BUS	0
EC47080	FLEX D/C BUS	0
EC47081	FLEX D/C BUS	0
EC47434	SFP Level Instruments (Channel A)	0
EC47435	SFP Level Instruments (Channel B)	0
EC 53852	Seismic II-I Walkdowns of Flooding Valves	0

Preventive Maintenance Tasks

PM403782	SFC-29B Functional Check
PM403781	SFC-29A Functional Check

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AOP-0029	Severe Weather Operation	38
AOP-0050	Station Blackout	
AOP-0065	Extended Loss of AC Power (ELAP)	1
EIP-2-024	Offsite Dose Calculations	25
EN-DC-115	Engineering Change Process	20
EN-DC-324	Preventive Maintenance Program	17
EN-LI-100	Process Applicability Determination	20
EOP-0001	Emergency Operating Procedure – RPV Control	27
EOP-0001A	Emergency Operating Procedure – RPV Control, ATWS	27
EOP-0003	Emergency Operating Procedure – Secondary	17

<u>Procedures</u> <u>Number</u>	<u>Title</u>	<u>Revision</u>
	Containment and Radioactive Release Control	
EOP-0004	Emergency Operating Procedure – Contingencies	15
EPP-2-501	Emergency Facilities and Equipment Readiness	17
OSP-0031	Log Report – Outside Area	88
OSP-0037	Shutdown Operations Protection Plan	36
OSP-0043	Freeze Protection and Temperature Maintenance	30
RBS-FSG-001	Long Term Reactor Vessel Cooling	2
RBS-FSG-002	Alternate RCIC Suction Source	0
RBS-FSG-003	Alternate Reactor Vessel Cooling	0
RBS-FSG-004	ELAP DC Bus Load Shed and Management	1
RBS-FSG-005	Initial Assessment and FLEX Equipment Staging	2
RBS-FSG-005-04	Cummins Onan 7.5 KW Ctech Generators FLX-EG8, EG9, EG10, EG11, EG12, and EG13	0
RBS-FSG-005-05	Generac IDLC 200 KW Generators FLX-EG1 and FLX-EG2	0
RBS-FSG-005-06	Generac IDLC 500 KW Generators FLX-EG3, EG4, and EG5	0
RBS-FSG-007	Loss of DC Control Power	1
RBS-FSG-011	Alternate Spent Fuel Pool Makeup and Cooling	3
RBS-FSG-012	Alternate Containment Cooling and Hydrogen Control	0
RBS-FSG-013	Transition from FLEX Equipment	1
RBS-FSG-100	*Beyond Designed Bases External Event (BDBEE) with an Extended Loss of Offsite and Onsite Power (ELAP) Emergency Response	2
RBS-FSG-101	BDBEE/EP Communications	1

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SOP-0091	Fuel Pool Cooling and Cleanup System	053
SOP-0099	Reactor Feed water System (SYS 107)	28
STP-602-4501	Spent Fuel Pool Level Instrument Channel Functional Test	1

Work Orders

400417	400421	400423	400426	400430	400433
400440	400444	400514	400517	400518	400526
400530	400536	400587	400606	400628	400629
400638	400639	401686	403670	403671	438427
438428	52626855	52626877	52626878	52697453	52697457
52702384	52702386	52702387	52702397	52732348	52732514
52746961	52747091				

W. Maguire

RIVER BEND STATION - INSPECTION OF THE IMPLEMENTATION OF MITIGATION STRATEGIES AND SPENT FUEL POOL INSTRUMENTATION ORDERS AND EMERGENCY PREPAREDNESS COMMUNICATION/STAFFING/MULTI-UNIT DOSE ASSESSMENT PLANS – INSPECTION REPORT 05000458/2017008 – AUGUST 1, 2017

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SUNSI Review: ADAMS: Non-Publicly Available Non-Sensitive Keyword:
By: JMM Yes No Publicly Available Sensitive NRC-002

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