



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
612 EAST LAMAR BLVD, SUITE 400  
ARLINGTON, TEXAS 76011-4125

May 13, 2011

Mr. Eric W. Olson  
Site Vice President  
Entergy Operations, Inc.  
River Bend Station  
5485 US Highway 61  
St. Francisville, LA 70775

SUBJECT: RIVER BEND STATION – NRC TEMPORARY INSTRUCTION 2515/183  
INSPECTION REPORT 05000458/2011007

Dear Mr. Olson:

On April 29, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your River Bend Station, using Temporary Instruction 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event." The enclosed inspection report documents the inspection results, which were discussed on May 4, 2011, with Mr. E. Olson and other members of your staff.

The objective of this inspection was to assess the adequacy of actions taken at River Bend Station in response to the Fukushima Daiichi Nuclear Station fuel damage event. The results from this inspection, along with the results from similar inspections at other operating commercial nuclear plants in the United States, will be used to evaluate the United States nuclear industry's readiness to respond to a similar event. These results will also help the NRC to determine if additional regulatory actions are warranted.

All of the potential issues and observations identified by this inspection are contained in this report. The NRC's Reactor Oversight Process will further evaluate any issues to determine if they are regulatory findings or violations. Any resulting findings or violations will be documented by the NRC in a separate report. You are not required to respond to this letter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Entergy Operations, Inc.

- 2 -

Sincerely,

*/RA/*

Vincent G. Gaddy, Chief  
Project Branch C  
Division of Reactor Projects

Docket: 50-458  
License: NPF-47

Enclosure: NRC Inspection Report 05000458/2011007  
w/Attachment: Supplemental Information

cc w/Enclosure:

Distribution via ListServ

Electronic distribution by RIV:

- Regional Administrator (Elmo.Collins@nrc.gov)
- Deputy Regional Administrator (Art.Howell@nrc.gov)
- DRP Director (Kriss.Kennedy@nrc.gov)
- DRP Deputy Director (Troy.Pruett@nrc.gov)
- DRS Director (Anton.Vegel@nrc.gov)
- DRS Deputy Director (Vacant@nrc.gov))
- Senior Resident Inspector (Grant.Larkin@nrc.gov)
- Branch Chief, DRP/C (Vincent.Gaddy@nrc.gov)
- RBS Administrative Assistant (Lisa.Day@nrc.gov)
- Resident Inspector (Andy.Barrett@nrc.gov)
- Senior Project Engineer, DRP/C (Bob.Hagar@nrc.gov)
- Project Engineer, DRP/C (Rayomand.Kumana@nrc.gov)
- Project Engineer, DRP/C (Jonathan.Braisted@nrc.gov)
- Public Affairs Officer (Victor.Dricks@nrc.gov)
- Public Affairs Officer (Lara.Uselding@nrc.gov)
- Project Manager (Alan.Wang@nrc.gov)
- Branch Chief, DRS/TSB (Michael.Hay@nrc.gov)
- RITS Coordinator (Marisa.Herrera@nrc.gov)
- Regional Counsel (Karla.Fuller@nrc.gov)
- NRR/DIRS/IRIB (Timothy.Kobetz@nrc.gov)
- Congressional Affairs Officer (Jenny.Weil@nrc.gov)
- OEMail Resource
- ROPreports
- RIV Executive Technical Assistant (Stephanie.Bush-Goddard@nrc.gov)
- DRS/TSB STA (Dale.Powers@nrc.gov)
- NSIR/DPR/EP (Eric.Schrader@nrc.gov)

R:\\_REACTORS/TI-183/RB2011007-TI-GL.docx

ADAMS ML

ADAMS: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		<input checked="" type="checkbox"/> SUNSI Review Complete	Reviewer Initials: VGG	
		<input checked="" type="checkbox"/> Publicly Available	<input checked="" type="checkbox"/> Non-Sensitive	
		<input type="checkbox"/> Non-publicly Available	<input type="checkbox"/> Sensitive	
SRI:DRP/C	RI:DRP/C	DRS/TSB	D:DRP/C	C:DRP
GLarkin	ABarrett	EARuesch	VGGaddy	
VGG for -E	VGG for -E	<b>/RA/</b>	<b>/RA/</b>	
05/10/11	05/10/11	05/10/11	05/12/11	

OFFICIAL RECORD COPY

T=Telephone

E=E-mail

F=Fax

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000458

License: NPF-47

Report: 05000458/2011007

Licensee: Entergy Operations, Inc.

Facility: River Bend Station

Location: 5485 U.S. Highway 61  
St. Francisville, LA

Dates: March 23, 2011 through April 29, 2011

Inspectors: G. Larkin, Senior Resident Inspector  
A. Barrett, Resident Inspector

Approved By: Vincent G. Gaddy, Chief, Project Branch C  
Division of Reactor Projects

## **SUMMARY OF FINDINGS**

IR 05000458/2011007, 03/23/2011 – 04/29/2011; River Bend Station, Temporary Instruction 2515/183 - Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event.

This report covers an announced temporary instruction inspection. The inspection was conducted by resident and Region IV inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

## **INSPECTION SCOPE**

The intent of the temporary instruction is to be a high-level look at the industry's preparedness for events that may exceed the design basis for a plant. The focus of the temporary instruction was on (1) assessing the licensee's capability to mitigate conditions that result from beyond design basis events, typically bounded by security threats; (2) assessing the licensee's capability to mitigate station blackout conditions; (3) assessing the licensee's capability to mitigate internal and external flooding events required by station design; and (4) assessing the thoroughness of the licensee's walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events possible for the site. If necessary, a more specific follow-up inspection will be performed at a later date.

## **INSPECTION RESULTS**

The following table documents the NRC inspection at River Bend Station performed in accordance with Temporary Instruction 2515/183. The numbering system in the table corresponds to the inspection items in the temporary instruction.

**03.01 Assess the licensee’s capability to mitigate conditions that result from beyond design basis events, typically bounded by security threats, committed to as part of NRC Security Order Section B.5.b issued February 25, 2002, and severe accident management guidelines and as required by Title 10 CFR 50.54(hh). Use Inspection Procedure 71111.05T, "Fire Protection (Triennial)," Section 02.03 and 03.03 as a guideline. If Inspection Procedure 71111.05T was recently performed at the facility the inspector should review the inspection results and findings to identify any other potential areas of inspection. Particular emphasis should be placed on strategies related to the spent fuel pool. The inspection should include, but not be limited to, an assessment of any licensee actions to:**

Licensee Action	Describe what the licensee did to test or inspect equipment.
<p>a. Verify through test or inspection that equipment is available and functional. Active equipment shall be tested and passive equipment shall be walked down and inspected. It is not expected that permanently installed equipment that is tested under an existing regulatory testing program be retested.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>The contingency/mitigation strategy pump (FPW-P4) and the hydrogen igniter diesel (HCS-ENG1) were tested by operational run using Procedure SOP-0054, "Contingency Equipment Operations," on March 17, 2011. The fire brigade van was inspected and was tested by operational run on March 16, 2011. The charger checks for the safety/relief valve battery cart were tested per Procedure OSP-0029, "Reactor/Auxiliary/Fuel Building Rounds," and completed satisfactorily on March 19, 2011. In addition, the licensee reviewed the preventative maintenance tasks and schedules for all mitigation strategy equipment and determined that all preventive maintenance tasks were current. The licensee inspected all passive equipment during a procedure walkdown.</p> <p>Describe inspector actions taken to confirm equipment readiness (e.g., observed a test, reviewed test results, discussed actions, reviewed records, etc.).</p> <p>The inspectors reviewed the completed test documentation for the contingency equipment and found the results satisfactory. In addition, the inspectors interviewed the station personnel that completed the equipment tests as to whether any anomalous events occurred during the equipment tests.</p>

	Discuss general results including corrective actions by licensee.
	Licensee activities verified that equipment was available and functional; no corrective actions were required.
Licensee Action	Describe the licensee's actions to verify that procedures are in place and can be executed (e.g., walkdowns, demonstrations, tests, etc.)
<p>b. Verify through walkdowns or demonstration that procedures to implement the strategies associated with B.5.b and 10 CFR 50.54(hh) are in place and are executable. Licensees may choose not to connect or operate permanently installed equipment during this verification.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>The licensee walked down Procedure OSP-0066, "Extensive Damage Mitigation Strategies," to determine if it was executable. The licensee also verified that the appropriate copies of this procedure were in place and that the procedure could be performed as written. Condition Report CR-RBS-2011-02987 was generated by the licensee to document the identified deficiencies which are listed in the corrective actions section below.</p> <p>Describe inspector actions and the sample strategies reviewed. Assess whether procedures were in place and could be used as intended.</p> <p>The inspectors performed a walkdown of Procedure OSP-0066, "Extensive Damage Mitigation Strategies," and stepped through the performance of 7 of 16 attachments (8, 9, 11, 12, 13, 17, and 19). The inspectors verified that the copy of Procedure OSP-0066 in the control room was the current revision. The inspectors reviewed the following strategies:</p> <p>ATTACHMENT 8 - RCIC Operation with a Loss of AC and DC Power;</p> <p>ATTACHMENT 9 - RCIC Alternate Flow Indication and RPV Water level Indication;</p> <p>ATTACHMENT 11 - Injection into RPV with Fire System;</p> <p>ATTACHMENT 12 - Electrical Power Restoration Methods to Support Mitigation Strategies;</p>

	<p>ATTACHMENT 13 - Spent Fuel Pool Emergency Makeup/Spray Strategies;  ATTACHMENT 17 - Alternate Power to SRVS; and  ATTACHMENT 19 - Miscellaneous Strategies</p> <p>The inspectors focused their reviews on alternate spent fuel pool cooling, the use of fire pumps to provide alternate core cooling, and manual operation of reactor core isolation cooling without AC or DC power. In addition, the inspectors reviewed the last triennial fire inspection report, which also inspected the station's implementation of B.5.b.</p> <hr/> <p>Discuss general results including corrective actions by licensee.</p> <hr/> <p>The licensee's walkdowns identified several deficiencies which were documented in Condition Report CR-RBS-2011-02987. The inspectors verified that the licensee had addressed each of those deficiencies by appropriate corrective actions. Those corrective actions included:</p> <ul style="list-style-type: none"> <li>• Procedural enhancements and corrections were incorporated into Revision 8 of Procedure OSP-0066 on April 7, 2011;</li> <li>• Tools and equipment needed for performance of Procedure OSP-0066 were staged; and</li> <li>• A quarterly work order was issued that will verify the required tools are in the toolbox. This work order will also inventory a new automotive jump-start device that is staged for Procedure OSP-0066 activities.</li> </ul> <p>In response to inspector-identified concerns that are documented in Condition Report CR-RBS-2011-03229, the licensee implemented corrective actions that included the following:</p> <ul style="list-style-type: none"> <li>• Government emergency telephone system (GETS) cards were verified to be available in the main control room, technical support center, and emergency operations facility but not specifically as described in OSP-0066. The procedure was revised to address the inaccurate procedure text;</li> <li>• The tools necessary to perform Procedure OSP-0066, Attachment 8, were staged in a</li> </ul>
--	--



	<p>tool box on Auxiliary Building 141, except for a hand-held tachometer that is staged in a bin in a tool room. Adjacent to that bin, the licensee added a placard to notify workers that one tachometer is required for Procedures OSP-0066 and SOP-0035, to prevent workers from checking out the last tachometer in the bin, and direct workers with questions to call the work management center or the main control room.</p>
<p>Licensee Action</p>	<p>Describe the licensee's actions and conclusions regarding training and qualifications of operators and support staff.</p>
<p>c. Verify the training and qualifications of operators and the support staff needed to implement the procedures and work instructions are current for activities related to B.5.b and severe accident management guidelines as required by 10 CFR 50.54 (hh).</p>	<p>The licensee reviewed the training records regarding Procedure OSP-0066, which was initially issued as Technical Support Guideline TSG-0002. The licensee completed this training in 2007/2008 using the following training materials:</p> <ul style="list-style-type: none"> <li>- Hale Fire Pump Operation</li> <li>- Alternate Power for the SRVs</li> <li>- RCIC Alternate Flow Indication and RPV Water Level Indication</li> <li>- Alternate Power for the Hydrogen Igniters</li> </ul> <p>These tasks were added to the nonlicensed operator and instant senior reactor operator qualification cards in 2009.</p> <p>Continuing training in the emergency planning area titled Extensive Damage Mitigation Training is assigned to all operations personnel. The emergency planning curriculum is completed on a frequency of every three years.</p> <p>The licensee reviewed the training requirements and records for severe accident management guidelines.</p>

	<p>Describe inspector actions and the sample strategies reviewed to assess training and qualifications of operators and support staff.</p>
	<p>The inspectors reviewed the lesson plans and presentations for Extensive Damage Mitigation Training and the severe accident procedures refresher training and determined that the training objectives are satisfactory. The inspectors also reviewed licensed operator qualification card requirements and found that the training material contained the appropriate training for B.5.b and severe accident response.</p>
	<p>Discuss general results including corrective actions by licensee.</p>
	<p>The licensee determined that all operations personnel were current for training in the emergency planning area.</p> <p>The licensee found that the electrical maintenance department had received training on the task characterized as "Alternate Power for the Hydrogen Igniters"; however, this information was not included in their training tracking system. The licensee documented this issue in Condition Report CR-RBS-2011-3015.</p> <p>The licensee concluded that all licensed operators had completed the severe accident procedure training in the Initial licensed operator training program as part of the emergency operating procedures training. Refresher training on the severe accident procedures is required every two years as part of the Licensed Operator Requalification Program. The licensee determined that all licensed operators have documented completion of this training.</p>

<p>Licensee Action</p>	<p>Describe the licensee's actions and conclusions regarding applicable agreements and contracts are in place.</p>
<p>d. Verify that any applicable agreements and contracts are in place and are capable of meeting the conditions needed to mitigate the consequences of these events.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>The licensee reviewed their agreements and contracts needed to mitigate the consequences of B.5.b. events.</p> <p>The following is a list of issues found by the licensee during their review of contracts and agreements:</p> <ol style="list-style-type: none"> <li>1. Vendors used for cranes and rigging had changed;</li> <li>2. Failed to include the Baton Rouge Area Mutual Aid System and the Governor's Office of Homeland Security and Emergency Planning as resources for earth moving equipment and helicopters;</li> <li>3. There was no standing contract for diesel generators and compressors with Cypress Equipment and Rentals; and</li> <li>4. Contact information for cabling vendors did not work.</li> </ol> <p>For a sample of mitigating strategies involving contracts or agreements with offsite entities, describe inspector actions to confirm agreements and contracts are in place and current (e.g., confirm that offsite fire assistance agreement is in place and current).</p> <p>The inspectors verified that the licensee had taken appropriate corrective actions to address the deficiencies identified by their review. In addition, the inspectors contacted a selected sample of the vendors directly to verify that the appropriate contracts were in place and workable.</p>

	<p>Discuss general results including corrective actions by licensee.</p>
	<p>The licensee's review found several deficiencies related to obsolete or missing contracts. The licensee updated the procedure with the correct contact information for vendors and made corrections to the procedure regarding the deficient items listed above.</p> <p>The inspectors' review did not identify a new issue.</p>
<p>Licensee Action</p>	<p>Document the corrective action report number and briefly summarize problems noted by the licensee that have significant potential to prevent the success of any existing mitigating strategy.</p>
<p>e. Review any open corrective action documents to assess problems with mitigating strategy implementation identified by the licensee. Assess the impact of the problem on the mitigating capability and the remaining capability that is not impacted.</p>	<p>The licensee is tracking all items associated with the review of the Fukushima Daiichi event in Condition Report CR-RBS-2011-02904. This condition report includes all of the deficiencies noted in the answers above, including inaccurate vendor/contractor information, inadequate documentation of training, tools and equipment that were not readily available, and outdated information in the response procedure. These deficiencies could have reduced the effectiveness of the mitigation strategies.</p>

**03.02 Assess the licensee’s capability to mitigate station blackout conditions, as required by 10 CFR 50.63, "Loss of All Alternating Current Power," and station design, is functional and valid. Refer to Temporary Instruction 2515/120, "Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22," as a guideline. It is not intended that Temporary Instruction 2515/120 be completely re-inspected. The inspection should include, but not be limited to, an assessment of any licensee actions to:**

<p>Licensee Action</p>	<p>Describe the licensee’s actions to verify the adequacy of equipment needed to mitigate a station blackout event.</p>
<p>a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>The station blackout diesel (BYS-EG1) was tested by operational run per Procedure SOP-0054, "Contingency Equipment Operations," on March 21, 2011. In addition, the licensee reviewed the preventative maintenance tasks and schedules for all the station blackout equipment and determined that all preventive maintenance tasks were current.</p> <p>Describe inspector actions to verify equipment is available and useable.</p> <p>The inspectors reviewed completed test documentation of the station blackout diesel and inspected the material condition of the station blackout diesel.</p> <p>The inspectors also walked down the station safety-related battery rooms.</p> <p>Discuss general results including corrective actions by licensee.</p> <p>No equipment deficiencies were identified by the licensee or inspectors.</p>

Licensee Action	Describe the licensee's actions to verify the capability to mitigate a station blackout event.
b. Demonstrate through walkdowns that procedures for response to a station blackout are executable.	In addition to the equipment testing described above, the licensee performed a step by step review of Procedure AOP-0050, "Station Blackout," and the attachments.
	Describe inspector actions to assess whether procedures were in place and could be used as intended.
	<p>In addition to the reviewing the results of the licensee's review, the inspectors reviewed Procedure AOP-0050, "Station Blackout," and selected specific items to review and inspect, including specific areas in the plant to walkdown. These items included:</p> <ul style="list-style-type: none"> <li>• verifying operator actions considering environmental conditions in the reactor core isolation cooling room;</li> <li>• control room temperature requirements and air circulation;</li> <li>• auxiliary building ventilation requirements;</li> <li>• methods to reduce DC power usage;</li> <li>• suppression pool temperature monitoring and actions to mitigate overheating or overfilling the pool; and</li> <li>• how to transfer diesel fuel oil between different diesel generators</li> </ul> <p>The inspectors reviewed Abnormal Operating Procedure AOP-0050, Attachment 10, "Using the Div 3 Diesel Generator to Supply Power to ENS-SWG1A," and Attachment 11, "Using the Div 3 Diesel Generator to Supply Power to ENS-SWG1B."</p>
	Discuss general results including corrective actions by licensee.
	The licensee identified procedural deficiencies and that tools needed to implement the procedure were not easily accessible, although all of the necessary tools and materials

	<p>were found to be available onsite. These issues were detailed in Condition Report CR-RBS-2011-03168. The most significant of the procedural deficiencies involved the contingency strategies that would start the Division I and II emergency diesel generators using compressed nitrogen. This strategy would have been unsuccessful because the diesel generators need both motive force and combustion air to start. The licensee's corrective actions staged air bottles to correct this condition and documented the deficiency in Condition Report CR-RBS-2011-3488. In addition, the licensee found that the primary and secondary contingency procedures used for containment venting during a station blackout would be difficult to perform successfully. The licensee is addressing these issues in their corrective action program and developing a new strategy for containment ventilation based on the secondary procedure which will deflate the containment airlock seals to protect the containment structure from over-pressurization.</p>
--	--

<p><b>03.03 Assess the licensee's capability to mitigate internal and external flooding events required by station design. Refer to Inspection Procedure 71111.01, "Adverse Weather Protection," Section 02.04, "Evaluate Readiness to Cope with External Flooding," as a guideline. The inspection should include, but not be limited to, an assessment of any licensee actions to verify through walkdowns and inspections that all required materials and equipment are adequate and properly staged. These walkdowns and inspections shall include verification that accessible doors, barriers, and penetration seals are functional.</b></p>	
<p>Licensee Action</p>	<p>Describe the licensee's actions to verify the capability to mitigate existing design basis flooding events.</p>
<p>a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>The licensee reviewed the station specific design and licensing basis documents associated with internal and external flooding to identify credited flood protection scenarios and features, credited flood mitigation functions, required materials, and/or equipment relied upon to safely shutdown the plant. The licensee performed walkdowns and inspections of those required features (doors, barriers, and penetration seals), materials and equipment to verify they were capable of performing their credited flood mitigation function. Visual observation included assessing material condition for signs of equipment degradation, proper staging and availability of equipment, correct implementation of credited flood</p>

	<p>mitigation design features, and equipment used to mitigate flooding (e.g., hose length and size, pump ratings).</p>
<p>Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.</p>	
<p>The inspectors reviewed the licensee’s design and licensing basis to ensure that the station’s evaluation of applicable internal and external flood features was complete and accurate in scope. The inspectors then compared equipment discussed in these documents to equipment the licensee had previously identified. The inspector did a walkdown inspection of the design and licensed features to assess material condition, interviewed responsible station employees, reviewed the maintenance history on selected equipment and reviewed station alarm response procedures to verify adequate instructions exist to mitigate an internal or external flood scenario.</p>	
<p>Discuss general results including corrective actions by licensee.</p>	
<p>In general, the licensee found minor documentation deficiencies. Several components credited for flood mitigation were not serviced by the station’s preventative maintenance program. The licensee judged that the components that lacked a regular scheduled preventative maintenance were able to perform their flood mitigation function. The inspectors identified no deficiencies that adversely affected safe shutdown or negated the capability to mitigate internal and external flooding events required by the station design. Specifically, the following conditions were documented in condition reports for additional review and corrective actions:</p> <ul style="list-style-type: none"> <li>• CR-RBS-2011-03258: Several instruments, credited to notify operators of internal flooding, had no identified preventative maintenance history. The station is currently evaluating its preventative maintenance strategy.</li> <li>• CR-RBS-2011-02984 and CR-RBS-2011-03272: Discrepancies in door gaps, door design, and other gaps were identified which in some cases result in minor internal flood level increases greater than assumed in the design basis analysis. These water level</li> </ul>	



	<p>increases would not result in submergence of any safe shutdown components.</p> <ul style="list-style-type: none"><li>• CR-RBS-2011-03266: Minor differences in curb heights differing from station design documents. These differences would not result in submergence of any safe shutdown components.</li><li>• CR-RBS-2011-03261: Inadequate preventative maintenance on external drainage pathways which resulted in undesirable debris, sedimentation, or vegetation accumulation. These conditions were determined to not invalidate assumption for external flood mitigation.</li><li>• CR-RBS-2011-03259: Berm around Unit 2 hole does not match statements in the Updated Safety Analysis Report.</li><li>• CR-RBS-2011-03260: Contradicting statements in the Updated Safety Analysis Report regarding flooding calculations.</li><li>• CR-RBS-2011-03346: Storm sewer outfall calculations impacted by the security project have not been updated.</li><li>• CR-RBS-2011-03535 and CR-RBS-2011-03524: Emergency core cooling cubicle water tight penetrations need inspection and design documentation corrections.</li></ul> <p>Assessments were made to relocate staged equipment, if the location appeared inadequate, such as above expected flood level. Condition Reports were written to identified gaps and/or deficiencies.</p> <p>The inspectors' review found that the licensee has no procedures in place that detail the response to external flooding events. The licensee documented this issue in Condition Report CR-RBS-2011-03940.</p>
--	---

**03.04 Assess the thoroughness of the licensee’s walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment’s function could be lost during seismic events possible for the site. Assess the licensee’s development of any new mitigating strategies for identified vulnerabilities (e.g., entered it in to the corrective action program and any immediate actions taken). As a minimum, the licensee should have performed walkdowns and inspections of important equipment (permanent and temporary) such as storage tanks, plant water intake structures, and fire and flood response equipment; and developed mitigating strategies to cope with the loss of that important function. Use Inspection Procedure 71111.21, "Component Design Basis Inspection," Appendix 3, "Component Walkdown Considerations," as a guideline to assess the thoroughness of the licensee’s walkdowns and inspections.**

<p>Licensee Action</p>	<p>Describe the licensee’s actions to assess the potential impact of seismic events on the availability of equipment used in fire and flooding mitigation strategies.</p>
<p>a. Verify through walkdowns that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>The licensee performed a site walkdown and inspection of equipment needed to mitigate fire and flood events to identify the likelihood that the equipment will adequately function after a safe shutdown seismic event. The scope of the walkdown included permanent, portable, and temporary equipment used to extinguish fires. Examples of inspected equipment include: pumps, valves, pipes, tanks, hoses, diesel, batteries, and fuel oil sources associated with fire protection; fire trucks, portable pumps, portable equipment related to fire suppression such as portable diesel power pumps, hoses and fittings; and permanent, portable, and temporary equipment used for mitigating internal and external floods (see § 03.03.a).</p> <p>For equipment used in fire and flooding mitigation that may not function after a safe shutdown seismic event, the licensee was developing mitigating strategies, to rely on alternate, procedurally controlled strategies and equipment that would mitigate the fire or flood concern.</p>

	<p>Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.</p>
	<p>The inspectors reviewed the station specific design and licensing basis documents associated with equipment needed to mitigate fire and flood events to confirm that the licensee's inspection scope was comprehensive. The inspectors performed a walkdown inspection to assess the material condition of the equipment. This inspection included visual inspection of associated fire pumps, motors, breakers, pipes, valves, tanks, structures, hoses, and fittings and inspection of nonseismic equipment and structures that could damage the credited equipment. The inspectors also assessed the likelihood that the fire and flood mitigation equipment would survive adequately to function after a safe shutdown seismic event.</p>
	<p>Discuss general results including corrective actions by licensee. Briefly summarize any new mitigating strategies identified by the licensee as a result of their reviews.</p>
	<p>The licensee did not identify any deficiencies or new mitigating strategies needed after a safe shutdown seismic event to mitigate flood events because all components were assessed to function properly.</p> <p>The licensee did identify mitigation strategies needed to ensure the B.5.b fire pump was available following a seismic event and that several hose racks in the turbine building need alternate manual fire fighting capability. Details are provided below:</p> <p>The B.5.b (Hale) fire pump is stored in a nonseismic, commercial grade metal building that the licensee expects to remain functional after a safe shutdown seismic event. Based on potential threats posed by adjacent activities and potential falling debris, actions were initiated to remove the overhead and adjacent hazards.</p> <p>Although not specifically designed and qualified seismic, the licensee considered the fire protection system components sufficiently rugged to function after a safe shutdown seismic event. The potential exception was associated with one 1.5-inch inside hose station located on turbine building elevation 123 feet (HR-53) and two 1.5-inch inside hose stations located on turbine building elevation 95 feet (HR-50 &amp; HR-52). The higher elevations of the turbine</p>

	<p>building could challenge the B31.1 piping designs as a result of elevation related increased seismic accelerations. In the event that these hose racks are not available after a safe shutdown seismic event, manual fire fighting capability can be supported in these area from yard fire hydrants and the nearest functional inside hose rack(s).</p>
--	---

### **EXIT MEETING SUMMARY**

The inspectors presented the inspection results to Mr. E. Olson, Site Vice President, and other members of licensee management at the conclusion of the inspection on May 4, 2011. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

E. Olson, Site Vice President  
T. Bolke, Licensing Specialist  
D. Burnett, Manager, Emergency Preparedness  
J. Clark, Assistant Operations Manager – Shift  
C. Coleman, Supervisor, Design Engineering  
F. Corley, Acting Manager, Design Engineering  
W. Fountain, Senior Licensing Specialist  
H. Goodman, Director, Engineering  
G. Krause, Assistant Operations Manager  
D. Lorfing, Manager, Licensing  
R. Persons, Superintendent, Training  
J. Roberts, Director, Nuclear Safety Assurance  
D. Vines, Manager, Corrective Actions and Assurance

### **LIST OF DOCUMENTS REVIEWED**

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

#### **03.01 Assess the licensee's capability to mitigate conditions that result from beyond design basis events**

##### MISCELLANEOUS

<u>NUMBER</u>	<u>DESCRIPTION OR TITLE</u>	<u>DATE</u>
6244.702-403-001	SBO Diesel Generator Test Report	January 13, 2010
RBC-41689	Station Blackout Analysis Safety Evaluation	March 11, 1992
RBC-42208	Station Blackout Analysis Supplemental Safety Evaluation	July 13, 1992
RBG-41646	Supplemental Response to Generic Letter 88-20	June 30, 1995

**03.02 Assess the licensee’s capability to mitigate station blackout conditions**

MISCELLANEOUS

<u>NUMBER</u>	<u>DESCRIPTION OR TITLE</u>	<u>DATE / REVISION</u>
SOP-0059	Containment HVAC System (SYS #403)	33
AOP-0050	Station Blackout	32
OSP-0066	Extensive Damage Mitigation Procedure	7
NRC Information Notice 2011-05	Tohoku-Taiheiyou-Oki Earthquake Effects On Japanese Nuclear Power Plants	March 18, 2011
NRC Inspection Report 05000458/2010006	NRC Triennial Fire Protection and Notice of Violation	June 17, 2010

**03.03 Assess the licensee’s capability to mitigate internal and external flooding events required by station design**

<u>USAR SECTION</u>	<u>TITLE</u>
2.4	Hydrologic Engineering
9.5.1.2.17	Drainage
9A.3.5.1.9	Floor Drains
9A.3.8.3	Submergence
7.4.1.5	Safe Shutdown Systems Design Basis Information
9.2.6.3	CST Safety Evaluation
9.3.7	Suppression Pool Pumpback System
3.4.1.1.3	Means of Providing Flood Protection
3.4	Water Level Flood Design
3.6	Protection against the Dynamic Effects Associated with the Postulated Rupture of Piping

MISCELLANEOUS

<u>NUMBER</u>	<u>DESCRIPTION</u>
PN -317	MELC - Max Flood Elevations for Moderate Energy Line Cracks in Cat 1 Structures

**03.04 Assess the thoroughness of the licensee's walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events**

<u>USAR SECTION</u>	<u>TITLE</u>	<u>DATE</u>
9A.2	Fire Protection Program Comparisons with Appendix R of 10 CFR 50	April 1998
Appendix 9B	Fire Protection Program Comparisons with Appendix R of 10CFR50	August 1987
2.5	Geology, Seismology, and Geotechnical Engineering Seismic Design	August 1987