



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

May 13, 2011

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

**SUBJECT: SURRY POWER STATION– NRC TEMPORARY INSTRUCTION 2515/183
INSPECTION REPORT 050000280/2011013 and 050000281/2011013**

Dear Mr. Heacock:

On April 29, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station Units 1 and 2 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 3, 2011, with Mr. B. Garber from your staff.

The objective of this inspection was to promptly assess the capabilities of Surry Power Station to respond to extraordinary consequences similar to those that have recently occurred at the Japanese Fukushima Daiichi Nuclear Station. The results from this inspection, along with the results from this inspection performed at other operating commercial nuclear plants in the United States, will be used to evaluate the U.S. nuclear industry's readiness to safely respond to similar events. 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 (PARS) component of

VEPCO

2

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).

Sincerely

/RA/

Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Enclosure: Inspection Report 050000280/2011013, 050000281/2011013
w/Attachment: Supplemental Information

cc w/encl: (See next page)

VEPCO

2

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).

Sincerely

/RA/

Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Enclosure: Inspection Report 05000280/2011013, 05000281/2011013,
w/Attachment: Supplemental Information

cc w/encl. (See next page)

X PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE X NON-SENSITIVE
ADAMS: X Yes ACCESSION NUMBER: ML111330132 X SUNSI REVIEW COMPLETE

OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRP		
SIGNATURE	SON /RA/	MES /RA/	Via email	Via email	GJM /RA/		
NAME	SNinh	MSchweig	RClagg	JNadel	GMcCoy		
DATE	05/11/2011	05/11/2011	05/12/2011	05/12/2011	05/12/2011		
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY
183 IR - JHN- REV1.DOCX

DOCUMENT NAME: G:\DRP\IRPB5\SURRY\REPORTS\2011\SURRY TI

cc w/encl:

Gerald T. Bischof
Site Vice President
Surry Power Station
Virginia Electric and Power Company
Electronic Mail Distribution

B. L. (Sonny) Stanley
Director, Nuclear Safety and Licensing
Virginia Electric and Power Company
Electronic Mail Distribution

Lillian M. Cuoco, Esq.
Senior Counsel
Dominion Resources Services, Inc.
Electronic Mail Distribution

Chris L. Funderburk
Director, Nuclear Licensing & Operations Support
Virginia Electric and Power Company
Electronic Mail Distribution

Ginger L. Alligood
Virginia Electric and Power Company
Electronic Mail Distribution

Virginia State Corporation Commission
Division of Energy Regulation
P.O. Box 1197
Richmond, VA 23209

Attorney General
Supreme Court Building
900 East Main Street
Richmond, VA 23219

Senior Resident Inspector
Surry Power Station
U. S. Nuclear Regulatory Commission
5850 Hog Island Rd.
Surry, VA 23883

Michael M. Cline, Director
Virginia Department of Emergency Services Management
Electronic Mail Distribution

VEPCO

4

Letter to David A. Heacock from Gerald J. McCoy dated May 13, 2011

SUBJECT: SURRY POWER STATION- NRC TEMPORARY INSTRUCTION 2515/183
INSPECTION REPORT 050000280/2011013 and 050000281/2011013

Distribution w/encl:

C. Evans, RII

L. Douglas, RII

OE Mail

RIDSNRRDIRS

PUBLIC

RidsNrrPMSurry Resource

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-280, 50-281

License Nos.: DPR-32, DPR-37

Report No.: 050000280/2011013, 050000281/2011013

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Road
Surry, VA 23883

Dates: March 23, 2011 through April 29, 2011

Inspectors: Rodney Clagg, Acting Senior Resident Inspector
Jared Nadel, Resident Inspector

Approved by: Gerald J. McCoy, Chief
Reactor Projects 5
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000280/2011013, 05000281/2011013; 03/23/2011 – 04/29/2011; Surry Power Station Units 1 and 2: Temporary Instruction 2515/183 – Follow-up to the Fukushima Daiichi Nuclear Station Fuel Damage Event

This report covers an announced Temporary Instruction inspection. The inspection was conducted by resident 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 TI is to provide a broad overview of the industry's preparedness for events that may exceed the current design basis for a plant. The focus of the TI was on (1) assessing the licensee's capability to mitigate consequences from large fires or explosions on site, (2) assessing the licensee's capability to mitigate station blackout (SBO) conditions, (3) assessing the licensee's capability to mitigate internal and external flooding events accounted for by the station's design, and (4) assessing the thoroughness of the licensee's walk downs 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

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.

Enclosure

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 of the Code of Federal Regulations (10 CFR) 50.54(hh). Use Inspection Procedure (IP) 71111.05T, "Fire Protection (Triennial)," Section 02.03 and 03.03 as a guideline. If IP 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	<i>Describe what the licensee did to test or inspect equipment.</i>
<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>Licensee actions included the identification of equipment (active and passive) utilized for implementation of B.5.b actions and any additional equipment used in Severe Accident Management Guidelines (SAMGs). The scope of the equipment was defined as that equipment specifically designated for B.5.b or SAMG mitigation (i.e., special hoses, fittings, portable pumps, portable generators, etc.). Permanent plant equipment (i.e., in situ equipment) was not considered in the scope, since it is normally in service, subjected to planned maintenance, and/or checked on operator rounds. The licensee then identified surveillances/tests and performance frequencies for the identified equipment, and reviewed the results of recent tests. Active equipment within the scope defined above that did not have recent test results was tested. Passive equipment within the scope was walked down and inspected.</p>
	<p><i>Describe inspector actions taken to confirm equipment readiness (e.g., observed a test, reviewed test results, discussed actions, reviewed records, etc.).</i></p>
	<p>The inspectors assessed the licensee's capabilities by conducting a review of the licensee's walkdown activities. In addition, the inspectors independently walked down and inspected all major B.5.b contingency response equipment staged throughout the site. Test results were reviewed for all active equipment tested and in one case a video recording of the actual test was reviewed. The inspectors' independent walkdowns confirmed the results obtained by the licensee with one exception, which is discussed in section 03.01(e).</p>
	<p><i>Discuss general results including corrective actions by licensee.</i></p>

	<p>All equipment (active and passive) designated for B.5.b was verified by the licensee to be in applicable procedures. All passive equipment was walked down and verified to be in place and ready for use. Passive equipment which had surveillance and/or preventative maintenance tasks had those activities performed to verify readiness for use.</p> <p>All active equipment located at the site was verified in place by the licensee. The licensee tested all active equipment; including a low head portable pump, two portable electric generators, and a portable welding machine.</p> <p>One of the portable generators and the portable welding machine both failed to start when tested. The generator had old gas and the welding machine had a dead battery; these issues were corrected by the licensee and both pieces of equipment subsequently started and ran satisfactorily. The licensee has entered the above issues into their CAP as CR 418083.</p> <p>The low head pump started and ran satisfactorily, but a >25gpm leak developed in a Polypipe fitting in the discharge piping. The licensee repaired the leak and re-started the pump, which significantly reduced but did not completely eliminate the leak. The licensee has entered the issue into their CAP as CR 418295.</p>
--	--

<p>Licensee Action</p>	<p><i>Describe the licensee's actions to verify that procedures are in place and can be executed (e.g. walkdowns, demonstrations, tests, etc.)</i></p>
<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</p>	<p>Licensee actions included the identification of those procedures utilized to mitigate the consequences of a B.5.b related event and severe accidents. The licensee then compiled verification documentation for procedure validations and identified any procedures not issued. The licensee validated that no open change requests were pending. Licensee personnel were then dispatched to walk down all applicable procedures to verify the ability of the procedures to be executed.</p> <p><i>Describe inspector actions and the sample strategies reviewed. Assess whether procedures were in place and could be used as intended.</i></p>

<p>verification.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>The inspectors assessed the licensee’s capabilities by conducting a review of the licensee’s walkdown activities. In addition, the inspectors selected several sections of a sample of the procedures walked down by the licensee and walked those down to independently verify the licensee’s conclusions. The inspectors’ independent walkdowns confirmed the results obtained by the licensee.</p>
	<p><i>Discuss general results including corrective actions by licensee.</i></p>
	<p>The licensee reviewed Severe Accident Mitigation Guidelines (SAMGs), Large Fire and Flooding Guidelines (LFFGs) and related strategies through both table top exercises and procedure walkdowns. Procedures used for B.5.b were reviewed by the licensee and walkdowns were performed by operators to ensure actions taken in the field in response to a B.5.b event could be performed.</p> <p>Some minor enhancements were identified by the licensee and entered into the CAP. Specific CRs are listed in section 03.01(e) below.</p>

<p>Licensee Action</p>	<p><i>Describe the licensee’s actions and conclusions regarding training and qualifications of operators and support staff.</i></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 Security Order Section B.5.b and severe accident management guidelines as required by 10 CFR 50.54 (hh).</p>	<p>Licensee actions included the identification of training/qualification requirements for operators for the implementation of actions needed to mitigate a B.5.b related event, and for the implementation of actions needed for the SAMGs. The licensee documented that operator training requirements were current. In addition, the licensee identified the training/qualification requirements for applicable emergency response organization (ERO) command and support staff for the implementation of actions needed to mitigate a B.5.b related event, and for the implementation of actions needed for the SAMGs, and documented that ERO command and support staff training requirements were current.</p> <p><i>Describe inspector actions and the sample strategies reviewed to assess training and qualifications of operators and support staff.</i></p>

	<p>The inspectors assessed the licensee's training and qualification activities by conducting a review of training and qualification materials and records related to B.5.b and SAMG event response. A sample of individual training records was also reviewed to verify that operators and ERO responders had the required training and that it was current.</p> <p><i>Discuss general results including corrective actions by licensee.</i></p> <p>The training requirements, qualifications, and associated records needed for operators for the implementation of SAMGs and B.5.b event response were reviewed by the licensee. Training was identified for shift managers, shift engineers, and unit supervisors, and verified that the training requirements were embedded within the position qualifications for the operators. The licensee confirmed that all shift operators verify their qualifications prior to assuming a shift position. The training requirements, qualifications, and associated records needed for ERO command and support staff for the implementation of actions needed to mitigate a B.5.b event or implement the SAMGs were also reviewed. All ERO command and support staff training requirements were verified as current by the licensee.</p>
<p>Licensee Action</p>	<p><i>Describe the licensee's actions and conclusions regarding applicable agreements and contracts are in place.</i></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>Licensee actions included the identification of all applicable contracts and agreements committed to be in place for the mitigation of a B.5.b related event. The licensee verified that the contracts and agreements were current, and documented whether or not the contracts/agreements were capable of meeting the mitigation strategy.</p> <p><i>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).</i></p> <p>The inspectors assessed the licensee's capabilities by conducting an independent review of contracts in place for the delivery of diesel fuel and gasoline, portable rental equipment, and certain B.5.b equipment vendors. Additionally, the inspectors reviewed licensee actions and actual use of several fuel contracts after the April 16, 2011 dual unit trip and LOOP.</p>

	<p>The inspectors reviewed the actual delivery of diesel and gasoline fuel to the site in accordance with several of the above mentioned contracts after the LOOP event and the loss of some onsite fuel supplies due to tornado damage. The inspectors' review of the contracts verified that they were current, and assessed whether or not it was adequate for meeting the licensee's mitigation strategy.</p>
	<p><i>Discuss general results including corrective actions by licensee.</i></p>
	<p>The licensee verified that all contracts in place were current and the vendors were contacted. In addition, all agreements with state and local authorities were verified through contact with the respective organizations.</p> <p>Some minor enhancements were identified by the licensee and entered into the CAP. Specific CRs are listed in section 03.01(e) below.</p>

<p>Licensee Action</p>	<p><i>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.</i></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 following entries into the licensee's CAP were made in response to issues identified in section 03.01:</p> <ul style="list-style-type: none"> • CR 382353: No procedure exists for testing the portable diesel driven fire pump [NRC-Identified] • CR 418083: Portable equipment failed to start • CR 418295: Leak on B.5.b poly pipe at drain valve • CR 421679: During review of IER L1 11-1 walkdown of 0-AP-17.04 an issue was found • CR 425577: B.5.b portable pump verification testing [NRC Identified] <p>The inspectors reviewed each CR for potential impact to the licensee's mitigation strategies. One NRC identified issue has the potential to impact the licensee's mitigation strategies. Specifically, the licensee identified, in CR 382353, that they did not have a test method or PM in place to verify the developed head and flow rate of the portable low head B.5.b pump. Thus, its ability to provide the assumed flow in all scenarios had not been verified. Several</p>

	<p>corrective actions were created to update procedures and annual vendor checks of the pump with the necessary steps needed to verify the pump will meet its design specifications. The NRC inspector identified that the corrective actions from this audit had not been implemented and, as a result, the licensee still did not have a method in place to verify the pump could perform its function. The licensee has entered this into their CAP as CR 425577.</p>
--	--

<p>03.02 Assess the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63, "Loss of All Alternating Current Power," and station design, is functional and valid. Refer to TI 2515/120, "Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22" as a guideline. It is not intended that TI 2515/120 be completely reinspected. The inspection should include, but not be limited to, an assessment of any licensee actions to:</p>	
<p>Licensee Action</p>	<p><i>Describe the licensee's actions to verify the adequacy of equipment needed to mitigate a SBO event.</i></p>
<p>a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>Licensee actions included the identification of equipment utilized/required for mitigation of a SBO. The licensee then conducted walkdowns of this equipment to ensure they were adequate and properly staged. Additionally, the licensee also conducted a review of open CAP items for potential SBO equipment impact.</p> <p><i>Describe inspector actions to verify equipment is available and useable.</i></p> <p>The inspectors assessed the licensee's capability to mitigate SBO conditions by conducting a review of the licensee's walkdown activities. In addition, the inspectors selected a sample of equipment utilized/required for mitigation of a SBO and conducted independent walkdowns of that equipment to verify that the equipment was properly aligned and staged. The sample of equipment selected by the inspectors included, but was not limited to, the SBO diesel generator and its auxiliaries. Additionally, the inspectors reviewed licensee actions and emergency equipment performance after the April 16, 2011 dual unit trip and LOOP. During that event, the SBO diesel generator automatically started and was manually aligned, per procedure, to carry load on its respective emergency bus.</p> <p><i>Discuss general results including corrective actions by licensee.</i></p>

	<p>The licensee's reviews verified that SBO equipment was ready to respond to a SBO condition. No issues with equipment were identified.</p>
--	--

<p>Licensee Action</p>	<p><i>Describe the licensee's actions to verify the capability to mitigate a SBO event.</i></p>
<p>b. Demonstrate through walkdowns that procedures for response to a SBO are executable.</p>	<p>Licensee actions included the identification of procedures required for response to a SBO, along with verification that the identified procedures were current and that no critical revision requests were in place. The licensee then verified that the mitigating procedures had been properly validated. Additionally, the licensee also conducted a review of open CAP items for potential impact to SBO procedures.</p>
	<p><i>Describe inspector actions to assess whether procedures were in place and could be used as intended.</i></p>
	<p>The inspectors assessed the licensee's capabilities by conducting a review of the licensee's walkdown activities. In addition, the inspectors selected several sections of a sample of the procedures walked down by the licensee and walked those down to independently verify the licensee's conclusions. Additionally, the inspectors reviewed licensee actions and emergency equipment performance after the April 16, 2011 dual unit trip and LOOP. During that event, the SBO diesel generator automatically started and was manually aligned, per procedure, to carry load on its respective emergency bus.</p>
	<p><i>Discuss general results including corrective actions by licensee.</i></p>

	<p>The licensee’s reviews verified that SBO procedures could be performed as written to respond to a SBO condition, with one exception. The licensee identified, in CR 421679, that the mark numbers for battery charger feeder breakers associated with the #1 and #2 EDGs in 0-AP-17.04, “EDG Emergency Operations”, were incorrect. The licensee entered this issue into their corrective action program and updated the procedure with the correct mark numbers.</p>
--	--

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

<p>Licensee Action</p>	<p><i>Describe the licensee’s actions to verify the capability to mitigate existing design basis flooding events.</i></p>
<p>a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>Licensee actions included the identification of equipment and penetration seals utilized/required for mitigation of internal and external flooding. The licensee then conducted walkdowns of this equipment to ensure it was adequate and properly staged. Doors, barriers, and penetration seals that were utilized for mitigation of flooding were identified, and checked to see if they were routinely inspected to ensure functionality. Where routine inspections were not performed or could not be relied upon to ensure functionality, the licensee performed walkdowns and inspections to ensure that the components were functional.</p> <p><i>Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.</i></p>

	<p>The inspectors assessed the licensee’s capabilities to mitigate flooding by conducting a review of the licensee’s walkdown activities. In several instances, these reviews involved the inspectors accompanying licensee engineering personnel during their in-field walkdowns. In addition, the inspectors conducted independent walkdowns of selected flood mitigation equipment to contribute to the overall assessment of the licensee’s flood mitigating capabilities. Licensee flood mitigation procedures were reviewed to verify usability. The inspectors’ conclusions aligned with the results obtained by the licensee.</p> <hr/> <p><i>Discuss general results including corrective actions by licensee.</i></p> <hr/> <p>The following entries into the licensee’s CAP were made in response to issues identified in section 03.03:</p> <ul style="list-style-type: none"> • CR 421104: Ductline sump Manhole No. 2 is not periodically inspected for water collection • CR 421129: During IER L1-11-1 walkdown manholes could not be accessed for inspection • CR 421178: During IER L1-11-1 walkdown open penetrations were found • CR 421203: During IER L1-11-1 walkdown open conduit and pipe tunnels found in turbine building. <p>The licensee’s verification of flood mitigation capability consisted of walkdowns and verification that the systems, structures, and components (SSCs) were present, periodically tested, in acceptable condition, and that design features, such as dike walls and spray shields, were properly installed and in good condition. Some minor issues were identified by the licensee and entered into the CAP. Specifically, there were some barriers located in areas that were not periodically accessed and thus were not inspected on a recurring basis. In addition, some areas were not immediately accessible for direct inspection during the licensee’s IER L1-11-1 response. The licensee has entered these issues into their CAP and plans to access these areas to complete the inspections at a later time. Specific CRs are listed above in this section.</p>
--	---

03.04 Assess the thoroughness of the licensee’s walkdowns and inspections of important equipment needed to mitigate fire and

<p>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 IP 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>	
<p>Licensee Action</p>	<p><i>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.</i></p>
<p>a. Verify through walkdowns that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>Licensee actions included the identification of equipment utilized/required for mitigation of fire and flood events. Licensee engineering personnel determined if the equipment was seismically qualified and identified seismic vulnerabilities, including storage locations, along with mitigating strategies for equipment that was not seismically qualified.</p>
	<p><i>Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.</i></p>
	<p>The inspectors conducted multiple walkdowns, both independently and in conjunction with licensee personnel, of important equipment needed to mitigate fire and flood events to identify the potential that the equipment’s function could be lost during a seismic event. This equipment included, but was not limited to:</p> <ul style="list-style-type: none"> • all major B.5.b contingency response equipment staged throughout the site; • all installed fire protection and suppression equipment in the Emergency Switchgear Room, EDG #1, EDG #2, and EDG# 3, and the low level intake structure; • the installed diesel and electric fire pumps and their controls; • floor and wall penetrations in the low level intake structure; and • the removable flood dikes associated with the low level intake structure <p>Licensee flood and fire mitigation procedures were reviewed to verify usability. The results of the inspectors’ reviews aligned with the licensee’s conclusions that there were a number of seismic vulnerabilities that potentially need to be addressed, as described below.</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.

The Surry General Nuclear Design Standard, STD-GN-003, defines three categories of seismic design qualification: Safety Related Seismic Class 1, Non-safety Seismic with Quality Related Functions (NSQ), and Non-seismic. Seismic Class 1 is defined as the safety related SSCs that have been formally qualified to function during and after a design basis earthquake, as applicable. NSQ SSCs are defined as structures that are not functionally safety related, but that are required to be seismically restrained, supported or anchored to prevent damage to nearby safety related equipment. The majority of equipment in the Turbine Building, which is most susceptible to flooding risk, is designated as non-safety/non-seismic. This designation includes flood mitigation sump pumps, flooding detectors, and the turbine building itself. However, there are specific portions of the fire protection system important to B.5.b strategies that are designed as Safety Related Seismic Class 1, including one of the installed fire pumps. Firefighting and other portable equipment staged to respond to B.5.b events is not stowed in Safety Related Seismic Class 1 buildings or locations, as a seismic event and B.5.b event have never been assumed to occur coincidentally.

The licensee's reviews identified instances where response capability could be enhanced. These included improving procedural guidance, reviewing the locations of portable equipment, and reviewing the need for supplemental portable equipment to compensate for turbine building flooding.

The licensee created a list of vulnerabilities from all of the observations, some of which are discussed above, of beyond-design-bases concerns that were identified while responding to IER L1-11-1. Further mitigation strategies, the licensee determined, will entail following industry recommendations from other plants that have identified similar beyond-design-bases vulnerabilities. The licensee has not entered these beyond-design-bases vulnerabilities into their CAP. They plan to collect these vulnerabilities at the corporate level and determine a fleet response in accordance with future industry recommendations.

Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. B Garber at the conclusion of the inspection on May 3, 2011. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. Proprietary information was identified and was returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

G. Bischof, Site Vice President
K. Sloane, Plant Manager (Nuclear)
B. Garber, Supervisor, Station Licensing
C. Olsen, Manager, Site Engineering

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 or 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

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
STD-GN-0003	Standard for Determining the Safety Classification of Structures, Systems, and Components	June 29, 2007
0-LSP-FP-005	Fire Protection Lockers, SCBA and Fire Engine Inspection and Inventory	15
0-LSP-FP-037	Inspection of Self-Contained Breathing Apparatus Cylinders and Emergency Response Portable Radios	5
ET-CME-07-0036	B.5.b Strategy Pump Evaluations for Surry Power Station	2
0-AP-22.02	Malfunction of Spent Fuel Pit Systems	10
70211873	Purchase Order	Exp. March 31, 2013
70176098	Purchase Order	Exp. December 31, 2012
70107894	Purchase Order	Exp. December 31, 2013
70163622	Purchase Order	Exp. December 31, 2012
13391-45	Purchase Order	Exp. December 31, 2012

03.02 Assess the licensee's capability to mitigate station blackout (SBO) conditions

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
0-AP-17.06	AAC Diesel Generator Emergency Operations	21
0-AP-17.04	EDG#1 or EDG #2 Emergency Operations	21
0-AP-17.05	EDG#3 Emergency Operations	20
1-ECA-0.0	Loss of All AC Power	32
2-ECA-0.0	Loss of All AC Power	33

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

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
0-MPM-1900-01	Periodic Inspection of Flood and Spill Protection Dikes, Dams, and Expansion Joint Shields	10
38102716563	Work Order: Mandatory Inspection of Dikes/Dams/Shields	December 9, 2010
38102395415	Work Order: Mandatory Inspection of Dikes/Dams/Shields	September 9 2010
38079627701	PM: Mandatory Inspection of Dikes/Dams/Shields	August 8, 2008

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>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
LFFG0	Large Fire, Flood Mitigating Guideline: Command and Control	1
LFFG1	Large Fire, Flood Mitigating Guideline: Operations Response	3
LFFG2	Large Fire, Flood Mitigating Guideline: TSC Response	7
0-FS-FP-300	Large Fire Loss Strategy	7

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
AF	Auxiliary Feedwater
ARM	Area Radiation Monitors
CAM	Continuous Air Monitors
CC	Component Cooling Water
CFR	Code of Federal Regulations
NRC	United States Nuclear Regulatory Commission