UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

May 13, 2011

Mr. Michael Colomb
Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
185 Old Ferry Road
P.O. Box 500
Brattleboro, VT 05302-0500

SUBJECT: VERMONT YANKEE – NRC TEMPORARY INSTRUCTION 2515/183
INSPECTION REPORT 05000271/2011009

Dear Mr. Colomb:

On April 22, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vermont Yankee Nuclear Power Station (Vermont Yankee), 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 April 22, 2011, with Mr. Wamser, General Manager, Plant Operations, Mr. Rademacher, Director, Engineering, and other members of your staff.

The objective of this inspection was to promptly assess the capabilities of Vermont Yankee 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 United States 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 NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

Lawrence T. Doerflein

Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No.: 50-271
License No.: DPR-28

Enclosure: Inspection Report No. 05000271/2011009

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Sincerely,

/RA/

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	50-271
License No.:	DPR-28
Report No.:	05000271/2011009
Licensee:	Entergy Nuclear Operations, Inc.
Facility:	Vermont Yankee Nuclear Power Station
Location:	Vernon, Vermont 05354-9766
Dates:	April 4, 2011 through April 22, 2011
Inspectors:	J. Bream, Physical Security Inspector, DRS A. Ziedonis, Acting Senior Resident Inspector, DRP
Approved by:	Lawrence T. Doerflein, Chief Engineering Branch 2 Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000271/201100905000; 04/04/2011 – 04/22/2011; Vermont Yankee Nuclear Power Station; Temporary Instruction 2515/183 - Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event.

This report covers an announced Temporary Instruction (TI) inspection. The inspection was conducted by a resident inspector and a region based inspector. 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 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 followup 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.

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	Describe what the licensee did to test or inspect equipment.
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. This review should be done for a reasonable sample of mitigating strategies/equipment.	The licensee performed walkdowns of active and passive equipment identified in the pre-established mitigating procedures for B.5.b and in severe accident management guidelines (SAMG). The licensee performed inventories of active and passive equipment to verify that equipment required to implement B.5.b and SAMG procedures was available. The licensee reviewed preventive maintenance tasks, as applicable, to ensure tasks were up to date and the equipment was available and functional. Active equipment such as pumps and portable generators were run to verify readiness. Additionally, the B.5.b and SAMG procedures were verified current and staged in the appropriate locations.
	Describe inspector actions taken to confirm equipment readiness (e.g., observed a test, reviewed test results, discussed actions, reviewed records, etc.).
	The inspectors performed walkdowns of licensee equipment with a knowledgeable licensed senior reactor operator to assess the adequacy of installed and portable equipment staged explicitly for implementation of the mitigation strategies. The inspectors also assessed the adequacy of the equipment storage locations for survivability and to identify any potential challenges to equipment material condition due to environmental conditions. The inspectors' walkdown included: the

		portable pump and associated suction and discharge lines; portable AC generators; portable DC power supplies; portable radios and other communication equipment; hoses and nozzles; and all associated tools. The inspector walkdown included equipment inventory verification. Additionally, the inspectors reviewed surveillance test results for applicable equipment. Inspector identified observations and deficiencies are described below.
		Discuss general results including corrective actions by licensee.
		The licensee identified enhancement opportunities associated with the mitigating equipment and procedures. The inspectors reviewed the enhancements identified by the licensee and determined there were no deficiencies in mitigating equipment or procedures. The inspectors identified three minor performance deficiencies regarding the licensee's maintenance of equipment relied upon in the B.5.b mitigation strategies. First, the inspectors identified that the licensee did not include the fire protection hoses relied on for B.5.b mitigating strategies into a preventive maintenance (PM) program in accordance with the PM for hoses credited specifically in the fire protection program. Hoses stored in the equipment storage boxes for B.5.b were not included into the population for required hydrostatic testing or periodic replacement in accordance with the site PM program. Based on questions raised by the inspectors, the licensee performed hydrostatic testing on the hoses and verified functionality. Additionally, the inspectors determined that the hoses were still within their PM periodicity for replacement had they been appropriately entered into the licensee's program. The licensee entered this issue into their corrective action program as CR-VTY-2011-01625. Second, the inspectors identified that there was no PM for the licensee to perform winter readiness preparations on the portable pump prior to the onset of below freezing temperatures. The inspectors determined that the licensee fully drains the pump after each use and maintains the engine block heater plugged in; however, the licensee does not perform any action to stabilize the diesel fuel tank prior to the onset of freezing temperatures or long periods of pump inactivity.

		The inspectors concluded, based on the licensee's actions described above and the fact that the pump did not exhibit any performance problems during the most recent pump surveillance, that the pump remained functional. Therefore, the inspectors determined that there was no loss of availability of the mitigation strategies associated with the portable pump. The licensee entered this issue into their corrective action program as CR-VTY-2011-01140. Finally, the inspectors identified that portable nitrogen gas bottles credited for manipulation of air operated valves were not periodically inspected to verify adequate gas pressure for implementation of B.5.b mitigation strategies. When questioned by the inspectors, the licensee performed pressure checks of all the nitrogen bottles and identified that the gas pressure in all of the bottles was below the nominal pressure rating on the equipment inventory list. However, the gas pressure in all of the bottles was above the required pressure necessary in the B.5.b implementing procedure. Therefore, the inspectors determined that there was no loss of availability of the mitigation strategies associated with the portable nitrogen bottles. The licensee entered this issue into their corrective action program as CR-VTY-2011-01648. The inspectors determined that the above issues were three examples of minor performance deficiencies with a common theme in that the licensee did not maintain equipment in accordance with guidance provided in NEI 06-12. Specifically, that "equipment associated with B.5.b mitigation strategies will meet industry practices for procuring and maintaining commercial equipment." In all three instances above, the equipment was determined to be functional and the inspectors did not identify any adverse impact to the availability of any B.5.b mitigating strategies.
Licensee Action		Describe the licensee's actions to verify that procedures are in place and can be executed (e.g., walkdowns, demonstrations, tests, etc.).

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. This review should be done for a reasonable sample of mitigating strategies/equipment.		Licensee personnel performed walkdowns of all B.5.b and severe accident mitigation strategies to verify that procedures in place were executable. The licensee walkdowns included an assessment of the amount and type of stored equipment to verify the B.5.b and severe accident mitigation strategies were adequate. One licensee-identified procedural weakness is described below under the discussion of general results.
		Describe inspector actions and the sample strategies reviewed. Assess whether procedures were in place and could be used as intended.
		The inspectors selected a sample of B.5.b and severe accident mitigation strategies for walkdown with a knowledgeable licensed senior reactor operator 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. One inspector identified observation is described below.
		Discuss general results including corrective actions by licensee.
		The inspectors identified an enhancement in the mitigating strategy for operation of the reactor core isolation cooling (RCIC) pump without DC power, coincident with the operation of two Automatic Depressurization System (ADS) safety relief valves (SRV) for reactor vessel pressure control and/or depressurization to evaluate and prioritize continued reactor pressure vessel control while operating RCIC in an adverse environment. The inspectors determined that no performance deficiency was associated with this observation, because the procedural actions were adequate to ensure successful operation of RCIC, and the SRVs would have operated at

		their designed mechanical relief set points absent of DC control power. The licensee entered this issue into their corrective action program as CR-VTY-2011-01643. The licensee identified a vulnerability in that additional portable equipment could be needed in order to implement sections of the B.5.b mitigation strategies than what was specified in procedures. Specifically, the licensee identified that portable hand pumps would be needed to get gasoline and diesel fuel out of onsite storage tanks during a loss of AC power. The licensee identified that there were additional sources of gasoline and diesel fuel in other locations onsite, not listed in the B.5.b mitigation strategies, which did not require the use of AC power such that there was no adverse impact to the B.5.b mitigating strategies. The licensee entered this issue into their corrective action program as CR-VTY-2011-01225. The inspectors determined this to be a minor issue because the licensee would have been able to obtain gasoline and diesel fuel from other onsite sources without adversely impacting strategy objectives. Therefore, the inspectors determined that there was no unrecoverable unavailability of the mitigation strategies. Based on the reviews conducted, the inspector concluded that procedures to implement the strategies associated with B.5.b and 10 CFR 50.54(hh) are in place and are executable.
Licensee Action		Describe the licensee's actions and conclusions regarding training and qualifications of operators and support staff.
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		The licensee conducted initial and continued B.5.b training and verified that training was completed. Additionally, the licensee verified that all required operations personnel have received initial and continuing SAMG training. The licensee reviewed training records and documentation to ensure that the training was up to date. Personnel with incomplete or missing qualifications were identified and training was performed or scheduled.
		Describe inspector actions and the sample strategies reviewed to assess training and qualifications of operators and support staff.

accident management guidelines as required by 10 CFR 50.54 (hh).		The inspectors reviewed training records for B.5.b and SAMG personnel training. In addition, the inspectors reviewed licensed and non-licensed operator initial and periodic training materials including: lesson plans, training presentations, lecture notes, and in field job performance training records. Finally, the inspectors observed one sample of licensed and non-licensed operator requalification training involving field walkdowns for implementation of B.5.b mitigating strategies.
		Discuss general results including corrective actions by licensee.
		No deficiencies were identified by the licensee. The inspectors reviewed licensee condition reports that were generated for any licensee personnel with missing or incomplete qualification records and determined that all NRC required training was completed appropriately. The inspector concluded that 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).
Licensee Action		Describe the licensee's actions and conclusions regarding applicable agreements and contracts are in place.
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.		The licensee verified that agreements from municipal fire departments and other commitments for various pieces of support equipment required to implement the strategies were in place in accordance with the requirements of the station emergency plan. The licensee verified that vendors and suppliers referenced in the mitigation strategies were still capable of supplying assumed services and that contact information was accurate. Additionally, the licensee identified additional suppliers as appropriate.

This review should be done for a reasonable sample of mitigating strategies/equipment.		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).
		The inspector verified that the licensee had in place current memoranda of understanding with off-site agencies to provide assistance in mitigation strategies. The inspectors reviewed the agreements to verify that they were current, and to assess whether or not they were adequate to meet the licensee's mitigation strategies.
		Discuss general results including corrective actions by licensee.
		The licensee identified that the Contingency Resource List contained in the B.5.b mitigation strategies, which identifies offsite resources that can be utilized in an emergency event, contained incorrect contact information for some of the offsite companies. The licensee entered this issue into their corrective action program as CR-VTY-2011-01215 and promptly corrected the inaccurate information. The inspectors reviewed the above CR to identify potential impacts to the licensee's mitigation strategies. The inspectors noted that the inaccurate information that the licensee identified related predominately to local businesses that could provide supplemental supplies and equipment and in each case the list contained other contacts that could provide the same service. No significant impacts were identified, and the inspectors determined that applicable agreements and contracts were in place and were capable of meeting the conditions needed to mitigate the consequences of these events.
Licensee Action		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.

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.	The licensee entered several issues into their corrective action program in response to issues identified during their review and the NRC inspection. These corrective actions are listed in the attachment. The inspectors reviewed the above CRs to identify potential impacts to the licensee's mitigation strategies. The licensee entered identified issues into their corrective action program in accordance with procedures and identified corrective actions or compensatory actions as appropriate. The inspector determined that none of the CRs identified during the inspection significantly impacted the potential to prevent the success of any existing mitigating strategy.

03.02 Assess the licensee's capability to mitigate 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:	
Licensee Action	Describe the licensee's actions to verify the adequacy of equipment needed to mitigate an SBO event.
a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.	The licensee conducted walkdowns and inspections to verify that all required equipment to mitigate station blackout was properly staged, tested and maintained.
	Describe inspector actions to verify equipment is available and useable.

		The inspectors reviewed design and licensing basis documentation to determine the licensee's coping analysis for station blackout conditions under the station's current licensing basis. The inspectors conducted walkdowns of in plant equipment to verify proper storage locations and inventories of staged equipment for SBO mitigation. The inspectors also conducted walkdowns of permanently installed equipment to verify alignments credited in the SBO procedure could be achieved. Finally, the inspectors discussed station blackout coping with staff engineers and operators, to assess the licensee's readiness for the station to cope with blackout conditions.
		Discuss general results including corrective actions by licensee.
		The licensee verified that equipment required for mitigation of an SBO was properly staged and maintained. The inspectors identified no concerns or observations related to this inspection area.
Licensee Action		Describe the licensee's actions to verify the capability to mitigate an SBO event.
b. Demonstrate through walkdowns that procedures for response to an SBO are executable.		The licensee identified procedures utilized in response to an SBO and performed an assessment to verify procedural adequacy. The licensee performed walkdowns of the procedure to verify procedural steps were adequate and performable.
		Describe inspector actions to assess whether procedures were in place and could be used as intended.

		The inspectors assessed the licensee's capability to mitigate SBO conditions though walkdowns of in plant equipment and a review of surveillance records and system health reports for equipment required to mitigate an SBO condition including: station batteries, the Vernon Tie Line, RCIC, and onsite emergency power supplies. The walkdowns included areas of the plant where operator actions would be required to establish alternate equipment alignments. Additionally, the inspectors conducted a tour of the Vernon Hydroelectric Station to assess the capability to black start the facility during a regional blackout to provide emergency power to Vermont Yankee. The purpose of the tour was also to confirm assumptions in the SBO design basis concerning the ability to restore power within the established coping time.
		Discuss general results including corrective actions by licensee.
		The licensee identified additional areas where permanent in-plant equipment could be relied upon to supply a mitigation function in the event of an SBO, including the identification of additional power supplies. The licensee entered the following issues into their corrective action program in response to issues identified during their review and the NRC inspection. • CR-VTY-2011-01143; Contact phone number for National Grid in Loss of Normal Power procedure was not correct • CR-VTY-2011-01214; Copies of current revisions of diagrams are not maintained in the Control Room • CR-VTY-2011-01274; Procedure enhancements identified for Loss of Normal Power, Station Blackout procedure • CR-VTY-2011-01735; Determine under what circumstances breaker at Vernon Hydro substation will open during an SBO event (NRC Identified)

		The inspectors reviewed the above CRs to identify potential impacts to the licensee's mitigation strategies. No significant impacts were identified.

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.		
Licensee Action		Describe the licensee's actions to verify the capability to mitigate existing design basis flooding events.
a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.		The licensee performed walkdowns and inspections to verify that all required material and equipment to mitigate internal and external flooding events required by the station's design basis were properly staged, adequate, and maintained. The licensee's walkdowns and inspections included verification that accessible doors, barriers and penetration seals were functional.
		Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.
		The inspectors reviewed design and licensing basis documentation to examine the licensee's design basis requirements for mitigating internal and external flooding events. The inspectors conducted internal and external flood protection walkdowns to assess the station's capability to meet flood protection design basis requirements, and to verify that required equipment was properly staged. The inspectors also discussed station flood protection design requirements with staff engineers and operators to ensure that required equipment was properly tested and maintained.

		Discuss general results including corrective actions by licensee.
		The inspector concluded that all required materials are adequate and properly staged, tested, and maintained to respond to an internal or external flood within the plant's design basis. While no operability or significant concerns were identified, the licensee identified issues with: the testing of portable flood contingency pumps; the storage and use of sandbags as a flood barrier; and several other minor internal flooding enhancement opportunities. The licensee appropriately entered these issues into their corrective action program, as listed in the Supplemental Information Attachment to this report. The inspector reviewed the associated condition reports and determined that the licensee's initial responses, including their assessment and prioritization, were appropriate.

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 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.

Licensee Action		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.
a. Verify through walkdowns that all required materials are adequate and properly staged, tested, and maintained.		The licensee performed walkdowns of equipment relied on for the mitigation of fire and flood events to identify potential equipment vulnerabilities to seismic events. Seismic vulnerabilities, including storage locations, were identified, and issues were entered into the licensee's corrective action program to assess mitigation strategies.

		Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.
		The inspectors conducted multiple walkdowns of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during the seismic event credible for the site. The inspector determined that the licensee meets the current licensing and design basis for B.5.b, fire protection, and flooding.
		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 licensee's review identified that fire protection equipment, as well as portable equipment used to mitigate a flood, were not stored in seismically qualified locations. Additionally, the licensee identified that some non-safety related batteries were not seismically supported or restrained. The licensee initiated WTVTY-2011-00159 to generate and document a mitigation strategy to compensate for non-seismic design aspects of the fire protection system. The licensee entered the following issues into their corrective action program in response to issues identified during their review: • CR-VTY-2011-01233; Primary fire brigade equipment room not seismically protected • CR-VTY-2011-01234; Turbine building equipment storage not seismically secured • CR-VTY-2011-01340; Emergency response information system batteries are not seismically restrained • CR-VTY-2011-01474; Portable equipment used to mitigate external flooding is stored in a non-seismic building • CR-VTY-2011-1683; Condensate transfer pumps were omitted from licensee reviews of flooding events and seismic vulnerabilities (NRC identified)

		The inspectors identified that the licensee's credited fire safe shutdown alternate power supply from the Vernon Hydroelectric Station, which is also the SBO power supply, was not seismically qualified. The licensee added this issue into their corrective action program under WTVTY-2011-00159. The inspectors concluded the licensee meets the current design and licensing bases for Appendix R power supply and SBO. In addition, the NRC established an agency Task Force following the events in Japan to conduct a near term evaluation of the need for agency actions on various issues, including SBO. The inspectors determined that the current seismic susceptibility of the equipment relied on to mitigate fire and flood events were beyond the current licensing and design bases for Vermont Yankee.

Meetings

4OA6 Exit Meeting

The inspectors presented the inspection results to Mr. Wamser, Mr. Rademacher, and other members of licensee management at the conclusion of the inspection on April 22, 2011. Proprietary information reviewed by the inspectors during the inspection was returned to the licensee. The inspectors verified the inspection report does not contain proprietary information.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

Robert Wanczyk, Licensing Manager
Jim Devincentis, Licensing Engineer
Patrick Ryan, Security Manager
Wayne Manning, Control Room Supervisor
Derek Jones, Assistant Operations Manager
William Pittman, Assistant Operations Manager
Jim Rogers, Design Engineering Manager
Dan Jefferies, Electrical Engineering Supervisor
Alan Robertshaw, Mechanical Design Engineer
Paul Johnson, Electrical Design Engineer

TransCanada (Vernon Hydro Station)

George R. Boothby, Director – U.S. Power
Joseph Avery, Connecticut River Area Manager, NEUS Hydro
Earl Brissette, Business Improvement Manager, Vernon Hydro Station

Nuclear Regulatory Commission

Wayne Schmidt, Senior Reactor Analyst
William Cook, Senior Reactor Analyst
Christopher Cahill, Senior Reactor Analyst
James Kim, Project Manager

Other

U. Vanags, State Nuclear Engineer, Vermont Department of Public Service

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

Procedures:

AP 3150, Extensive Damage Mitigation Strategy for Establishing Command and Control, Revision 0
DP 4107, EOP/Alternate Shutdown Tools and Supplies Surveillance, Revision 15
OP 1100, Refuel Platform Operation, Revision 40
OP 2200, Operation of the Reactor and Turbine Bridge Cranes, Revision 35
OE 3107, EOP/SAG Appendices, Revision 27
OE 3107, Primary Containment Venting Methods, Revision 27
ON 3157, Loss of Fuel Pool Level, Revision 9
PP 7019, Severe Accident Management Program, Revision 5
PP 7019, Appendix A, Vermont Yankee Severe Accident Guidelines Implementation Guide, Revision 1
PP 7019, Appendix E, Technical Support Guidelines, Revision 1
PP 7019, Appendix G, Loss of Large Ares of the Plant due to Fire or Explosion, Revision 11

Self Assessment:

Snapshot Assessment of B.5.b Phase 2 and 3 Strategies, 3/30/2008

Training Documents:

LOT-00-624, Severe Accident Management Overview, Revision 3
LOT-01-624, Severe Accident Guidelines, Revision 13
LOT-00-625, Primary Containment Venting, Revision 6
VLP-OPS-B5B-TRA, SAG Appendix G Loss of Large Areas of the Plant due to Fire or Explosion, Revision 1

Calculations:

EC-2157, Estimated Flowrates for B.5.b Strategies
EC-6727, Further Estimated Flowrates for B.5.b Strategy
EC-7522, Enhancements for Estimated Flowrates for B.5.b Strategies (Associated with EC-2157 and EC-6727)

Work Orders:

WO-VTY-00252669, B5B-ELEC-GEN-1B; Elect. Annual PM of Portable Generator, 10/19/2010
WO-VTY-00252667, B5B-ELEC-GEN-1A; Elect. Annual PM of Portable Generator, 10/19/2010
WO-VTY-00249432, B5B-ES-DC-4; Perform 2 YR PM on 120VDC DC Power Supply, 9/14/2010
WO-VTY-00249431, B5B-ES-DC-5; Perform 2 YR PM on 24VDC DC Power Supply, 9/14/2010
WO-VTY-52300051, DP4107(6M) B5B Toolbox/Equipment Inventory, 3/29/2011
WO-VTY-52297390, Semi-Annual Mechanical PM of Hale Diesel Pump, 3/31/2011
WO-VTY-52262081, Mechanical Annual PM of Hale Diesel Pump, 9/22/2010

WO-VTY-52261852, Elect Annual PM Hale Diesel Pump, 9/27/2010
WO-VTY-52261843, Elect 2 Year PM Hale Diesel Pump, 9/13/2010
WO-VTY-52260528, I&C Annual Equipment Inspection for B5B, 9/16/2010

Condition Reports:

CR-VTY-2008-01723, ACE: NRC B5b Inspection Yielded 5 Findings, 4/21/2008
CR-VTY-2011-01140, Areas for Improvement noted in B5b diesel pump run, 3/17/2011
CR-VTY-2011-01174, Low Water Level in B5b Batteries, 3/21/2011
CR-VTY-2011-01197, Procedure Directions to Operate RCIC without Power, 3/22/2011
CR-VTY-2011-01199, CRP 9-15 Terminal Strip Label not Aligned Properly, 3/22/2011
CR-VTY-2011-01202, Generator, Referenced in PP 7019, Found Inoperable, 3/22/2011
CR-VTY-2011-01204, 18-month Emergency Radio Surveillance not Scheduled, 3/22/2011
CR-VTY-2011-01214, Copies of Current Revisions of Diagrams are not Maintained in the Control Room, 3/22/2011
CR-VTY-2011-01215, Contingency Resource List Requires Revision to Update Contact Numbers and Remove Invalid Entries, 3/22/2011
CR-VTY-2011-01216, Appendix G, Attachment 6 Cables Should be Fabricated and Added to Equipment Inventory, 3/22/2011
CR-VTY-2011-01218, Appendix G, Attachment 6 Cables Should be Fabricated and Added to Equipment Inventory, 3/22/2011
CR-VTY-2011-01219, Wrong Wrench Listed in SAG Appendix G, 3/22/2011
CR-VTY-2011-01220, Mark Areas Surrounding Necessary Reactor Building Penetrations as Equipment Storage Prohibited Zones, 3/22/2011
CR-VTY-2011-01221, Appendix G Enhancement to Procedure to Coordinate with Security to Bring Equipment through SOCA Fence, 3/22/2011
CR-VTY-2011-01222, SAG Valve Location, 3/22/2011
CR-VTY-2011-01223, SCBA Should not have a Required Offsite Inventory, 3/22/2011
CR-VTY-2011-01225, Enhancements to PP 7019 Identified, 3/22/2011
CR-VTY-2011-01288, B5b Pump Low Tire Pressure, 3/26/2011
CR-VTY-2011-01291, OSC Equipment not Powered from John Deere Diesel, 3/27/2011
CR-VTY-2011-01298, Letter of Agreement with Brattleboro Fire Department not Incorporated into E-plan, 3/27/2011
CR-VTY-2011-01372, Enhanced OBE Guidance for EAL Declaration, 4/2/2011
CR-VTY-2011-01524, B5b Equipment Inventory, 4/11/2011
CR-VTY-2011-01618, During B5b Walkdown, NRC Identified that an Inventoried Ladder was Staged but not Secured, 4/18/2011
CR-VTY-2011-01625, During B5b Walkdown, NRC Identified that Staged Hoses are not Included in a Hydo Surveillance Cycle (NRC Identified), 4/18/2011
CR-VTY-2011-01643, Evaluate Need for Additional Guidance to Operators on RCIC Manual Operation Given Potential Environmental Conditions (NRC Identified), 4/19/2011
CR-VTY-2011-01648, Nitrogen Bottle Pressure Found Below Value Identified in Inventory (NRC Identified), 4/19/2011
CR-VTY-2011-01301, CAD Venting Potential for Adverse Ventilation Flow, 3/28/2011
CR-VTY-2011-01681, Several Containment Vent Methods Could Propagate Hydrogen into Adjacent Buildings, 4/21/2011

Other:

VYOTPF 4104, Fire Hose Hydro Test Surveillance, 4/29/2011

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

Procedures:

DP 4107, EOP/Alternate Shutdown Tools and Supplies Surveillance, Revision 15
OT 3122, Loss of Normal Power, Revision 43
OT 3122, Loss of Normal Power, Revision 44
OP 4142, Vernon Tie and Delayed Access Power Source Backfeed Surveillance, Revision 16
OP 4127, John Deere Diesel Generator Surveillance, Revision 24

Surveillances:

OP 4142, Vernon Tie and Delayed Access Power Source Backfeed Surveillance, 5/31/2007
OP 4127, John Deere Diesel Generator Surveillance, 4/9/2011

System Health Report:

Emergency Diesel Generators, Q4-2010
250 Volt DC Electrical System, Q4-2010
125 Volt DC Electrical System, Q4-2010
24 Volt DC Electrical System, Q4-2010
Reactor Core Isolation Cooling, Q4-2010

Diagrams:

A-191353-DC-ECCS-B, Power Distribution Panel Schedule, Revision 6
B-191301-SH-00865, Control Wiring Diagram ECCS Analog Trip Division II, Sheet 1, Revision 13
B-191301-SH-01177, RCIC Alternate Shutdown System Instrumentation, Revision 5
B-191301-SH-01230, Primary Containment Temperature Monitor Indication and RCDR SI/NNS, Revision 19
G-191163 Sheet 2, Flow Diagram Fire Protection System Outer Loop, Revision 15
G-191298 Sheet 3, Main One Line Wiring Diagram, Revision 3

Work Orders:

WO-VTY-51564890, B-AS-1 Battery Modified Performance Test per RP 5276, 12/30/2008
WO-VTY-52029698, B-AS-2 Service Test – Alternate Shutdown Battery, 7/16/2009
WO-VTY-52283051, B-AS-2 Alternate Shutdown Battery Service Test, 1/20/2011
WO-VTY-51644012, Main Station Battery Performance Test, 11/7/2008
WO-VTY-51077780, Main Station Battery Performance Test, 5/28/2007
WO-VTY-51078272, B-1-1A Main Station Battery Performance Test, 6/1/2007
WO-VTY-51644013, B-1-1A Main Station Battery Performance Test OP 4125, 11/7/2008
WO-VTY-52187881, B-1-1A Main Station Battery Service Test OP 4215, 4/29/2010

Condition Reports:

CR-VTY-2011-01143, Contact Phone Number for National Grid Transmission in Loss of Normal Power Procedure was Not Correct, 3/17/2011
CR-VTY-2011-01214, Copies of Current Revisions of Diagrams are not Maintained in the Control Room, 3/22/2011
CR-VTY-2011-01274, Procedure Enhancements Identified for Loss of Normal Power and Station Blackout Procedure, 3/24/2011
CR-VTY-2011-01321, Procedure Temporary Change to Add Instructions for Powering Batteries from UPS MG-1A(B), 3/29/2011
CR-VTY-2011-01322, Training: Simulator Scenarios for Station Blackout Scenarios Could be Extended, 3/29/2011
CR-VTY-2011-01735, Determine under what Circumstances Breaker at Vernon Hydro Substation will Open during an SBO Event (NRC identified), 4/26/2011

Other:

Vernon Station – Black Start Procedure, Hydro Operator Training Manual, 12/20/2007
BVY 08-043, Vermont Yankee Nuclear Power Station License No. DPR-28 Update to Periodic Testing of Alternate AC Source, 8/14/2008
Safety Evaluation by the Office of Nuclear Reactor Regulation, Station Blackout Evaluation, 6/5/1991
Supplemental Safety Evaluation by the Office of Nuclear Reactor Regulation, Station Blackout Evaluation, 9/1/1992
Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 229 to Facility Operating License No. DPR-28, Section 2.3.5: Station Blackout, 3/2/2006
VY-RPT-05-00004, VYNPS EPU SBO Coping Analysis Report, Revision 0
IPEEE, Vermont Yankee Nuclear Power Station Individual Plant Examination of External Events, Revision 2

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

Procedures:

OPOP-PHEN-3127, Natural Phenomena, Revision 0

Condition Reports:

CR-VTY-2011-01213, Test Portable Pumps used for Flooding Contingencies, 03/22/2011
CR-VTY-2011-01217, Procedure Enhancements Regarding On-site Storage and Vendor Contracts for Sand Bags Usage during External Flooding Events, 03/22/2011
CR-VTY-2011-01406, Several Minor Internal Flooding Enhancement Opportunities, 04/04/2011

Other:

Design Basis Document for Internal Flooding, Revision 9
IPEEE, Vermont Yankee Nuclear Power Station Individual Plant Examination of External Events, Revision 2
Vermont Yankee Response to Request for Additional Information Concerning VY-IPEEE, 12/28/1999
Updated Final Safety Analysis Report, Section 2.4.3.4: Floods, Revision 24

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

Condition Reports:

CR-VTY-2011-01233, Primary Fire Brigade Equipment Room not Seismically Protected, 03/23/2011
CR-VTY-2011-01234, Turbine Building Equipment Storage not Seismically Secured, 03/23/2011
CR-VTY-2011-01340, Emergency Response Information System Batteries are not Seismically Restrained, 03/30/2011
CR-VTY-2011-01474, Portable Equipment used to Mitigate External Flood in non-Seismic Building, 04/06/2011
CR-VTY-2011-01683, Condensate Transfer Pumps Omitted from Licensee Reviews of Flooding Events and Seismic Vulnerabilities (NRC identified), 04/21/2011
CR-VTY-2011-01789, Fire Suppression Pipe Hanger Issue, 05/01/2011
LO-WTVTY-2011-00159, Seismic Vulnerabilities, 04/04/2011

Other:

Updated Final Safety Analysis Report, Section 2.5.4: Seismology, Revision 24
Updated Final Safety Analysis Report, Section 12.2.1: Loading Considerations for Structures, Foundations, Equipment and Systems, Revision 24
Updated Final Safety Analysis Report, Section 12.2.6.5: Cooling Tower Deep Basin, Revision 24

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ADS	Automatic Depressurization System
CFR	Code of Federal Regulations
IP	Inspection Procedure
PM	Preventive Maintenance
RCIC	Reactor Core Isolation Cooling
SAMG	Severe Accident Management Guidelines
SBO	Station Blackout
SOCA	Security Owner Controlled Area
SRV	Safety Relief Valves
NRC	Nuclear Regulatory Commission