

## Vermont Yankee 2Q/2013 Plant Inspection Findings

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### Initiating Events

**Significance:** G Oct 16, 2012

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Incorrect Assessment of Equipment Condition Resulted in Single Recirculation Loop Operation**

A self-revealing finding was identified because Entergy failed to implement a preventive maintenance procedure. Specifically, Entergy personnel classified the discovery status code for the minor motor inspection on the “A” recirculation pump motor generator set drive motor incorrectly, as “B – satisfactory or normal wear,” instead of “D – abnormal wear,” resulting in a missed opportunity to replace degraded components that caused the “A” recirculation pump to trip and an unplanned entry into single recirculation loop operation. Entergy’s corrective actions included cleaning the motor and the junction box, replacing components that had been damaged by the arc flash, and testing the circuit to verify no other components were degraded prior to restarting the motor. In addition, Entergy initiated condition report CR-VTY-2012-02811 and issued a corrective action to reinforce the requirements of EN-DC-324 among maintenance staff. Entergy also plans to add all large motor and generator junction boxes to the predictive maintenance program and to perform thermography on them on a six month frequency.

The inspectors determined that the issue was more than minor because it resulted in a transient, i.e. an event that upset plant stability (an unplanned entry into single recirculation loop operation). In particular, the issue is associated with the Equipment Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of events that upset plant stability during power operations. The inspectors determined the significance of the finding using IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power.” The finding was determined to be of very low safety significance (Green) because the finding was a transient initiator that did not cause a reactor trip. The inspectors determined that the finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Entergy did not sufficiently define and effectively communicate expectations regarding procedural compliance for the selecting of the discovery status code and personnel did not follow procedures. [H.4(b)]. (Section 1R12)

Inspection Report# : [2012004](#) (*pdf*)

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### Mitigating Systems

**Significance:** G Jun 30, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Inadequate Corrective Actions for Sealing Flood Pathways into the Electrical Switchgear Rooms**

Two examples of a self-revealing, non-cited violation of 10 CFR 50 Appendix B, Criterion XVI, “Corrective Action,” were identified because Entergy did not promptly identify and correct conditions adverse to quality related to flood protection of the switchgear rooms. Specifically, mechanical screw-type flood seals were not promptly replaced with reliable foam seals and an open drain line was not promptly identified and corrected allowing for water intrusion

pathways into the switchgear rooms. Entergy's corrective action to restore compliance consisted of sealing all the potential pathways with Sylguard by April 8.

The inspectors determined that the failure to identify the flood pathways was a performance deficiency that was within Entergy's ability to foresee and correct and should have been prevented. This finding is more-than-minor because it is associated with the protection against external events attribute of the Mitigating Systems cornerstone, and affected the objective to ensure the availability and reliability of systems that respond to external events to prevent undesirable consequences. Specifically, the failed flood barriers provided an external flood waters pathway that could potentially impact the reliability and availability of both electrical switchgear rooms during a design basis flood event. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 4 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding was of very low safety significance (Green), because, in spite of the failed flood barriers, sufficient water removal capability was available to ensure there was no loss of electrical switchgear safety function. The switchgear would still have been able to perform its function because the water level would have been maintained below floor level using the additional sump pump capacity available on site.

The inspectors determined that the finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Entergy did not identify these issues in a timely manner commensurate with their safety significance. Specifically, Entergy had opportunities as part of the extent of condition from the 2012 flood seal failure and as part of the Fukushima flooding walkdowns to identify the additional possible flood paths and did not.

Inspection Report# : [2013003](#) (pdf)

**Significance:**  Jun 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Maintain Compensatory Measures Required for a Barrier Breach Permit for the "A" Emergency Diesel Generator Room**

The inspectors identified a Green NCV of TS 6.4, "Procedures," because Entergy did not implement a barrier breach permit required by procedure. Specifically, Entergy personnel created three open penetrations to the "A" emergency diesel generator (EDG) room when the barrier breach permit for the planned modification allowed only one hole at a time. Entergy's corrective action to restore compliance consisted of installing the tubing and grouting the three holes.

The inspectors determined that Entergy's failure to properly implement a barrier breach permit by opening three holes in the "A" EDG room west wall instead of only one was a performance deficiency that was reasonably within Entergy's ability to foresee and correct and should have been prevented. This finding is more than minor because it is associated with the Design Control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the capability of the "A" EDG room west wall to limit the intrusion of a high energy line break into the "A" EDG room was reduced more than allowed and accepted by the barrier breach permit, and the equipment within the "A" EDG room was only qualified for a mild environment (i.e. not a steam or high temperature environment). Additionally, the finding is similar to IMC 0612, Appendix E, "Examples of Minor Issues," examples 3.i. and 3.j., more than minor descriptions, because the accident analysis calculation had to be re-performed to assure the accident analysis requirements were met and there was reasonable doubt on the operability of the equipment without the re-analysis.

In accordance with IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is if very low safety significance (Green) because the finding is a deficiency affecting the

qualification of a mitigating structure but the structure maintained its functionality. Specifically, the “A” EDG room west wall would have sufficiently limited the intrusion of steam from a design basis high energy line break to maintain the operability of equipment within the “A” EDG room.

The inspectors determined that the finding had a cross-cutting aspect in the Human Performance area, Work Control component, because Entergy personnel did not appropriately coordinate work activities by incorporating actions to address the need to keep personnel apprised of the operational impact of work activities. Specifically, Entergy identified the need for compensatory measures for the barrier breach permit, but the necessary actions were not sufficiently communicated to maintenance or operations personnel

Inspection Report# : [2013003](#) (*pdf*)

**Significance:** G Jun 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Improper Maintenance Rule Scoping of the Reactor Building HVAC System**

The inspectors identified a Green NCV of 10 CFR 50.65(b)(2) because Entergy did not properly scope the reactor building heating, ventilation and air conditioning (HVAC) system within the station’s maintenance rule program. Specifically, the inspectors determined Entergy did not properly scope the reactor building HVAC system, specific to the system’s function to run and assist in area temperature control, into the maintenance rule program as required of a system that is directly used in the emergency operating procedure (EOP)-4, Secondary Containment Control, to assist in mitigating a high temperature condition.

The inspectors determined that this finding was more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and because it impacts the associated cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, reliably starting reactor building HVAC system could mitigate a high temperature condition in the reactor building during an event or system which requires EOP-4 entry. The performance deficiency was also determined to be similar to more than minor example 7.d per IMC 0612, Appendix E, “Examples of Minor Issues.” The inspectors completed a Phase 1 screening of the finding per IMC 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings” and determined the finding to be of very low safety significance (Green) because the performance deficiency was not a design or qualification deficiency, did not involve an actual loss of safety function, did not represent actual loss of a safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The inspectors did not identify a cross-cutting aspect associated with the finding because the underlying performance aspects occurred in the late 1990s and no recent operating experience would reasonably have prompted Entergy to review their scoping adequacy.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:** G Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Appendix R Fire Door Not Latching Closed Due to Misalignment**

The inspectors identified an NCV of operating license condition 3.F, fire protection program, because Entergy did not correct a degraded latch on a three-hour rated fire door on the entrance to the “B” emergency diesel generator (EDG) room, and as a result the three-hour fire barrier was non-functional and the required compensatory measure of an hourly fire watch was not in effect. Entergy’s corrective actions included restoring vertical alignment of the latching mechanism, further inspection by a locksmith to ensure reliable operation, planning a preventive replacement of the

latch due to existing excessive wear, and initiating a condition report.

The finding is more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the fire door being degraded with unreliable latching without an assigned hourly fire watch from January 20 to January 22 resulted in a barrier to fire propagation that was less robust than required by the approved fire protection program. In accordance with IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix F, "Fire Protection Significance Determination Process," the inspectors determined that this finding is of very low safety significance (Green) per Task 1.3.2, "Task 1.3.2: Supplemental Screening for Fire Confinement Findings." The inspectors determined the degradation rating associated with the deficiency to be Moderate B since a closure mechanism held the door against the door jamb, the door swings out from the EDG room, no combustibles were stored in the adjacent hallway, and no equipment important to safety exists in the turbine building hallway. Therefore, the degraded fire door provided a minimum of 20 minutes of fire endurance protection and the fixed or in situ fire ignition sources and combustible or flammable materials were positioned such that, even considering fire spread to secondary combustibles, the degraded fire door would not have been subject to direct flame impingement since no combustible material was located near the door during the time of concern. The inspectors determined that the finding had a cross-cutting aspect in the Problem Identification and Resolution area, Corrective Action Program component, because Entergy personnel did not completely identify the issue with the alignment of the striker plate when the degradation was first identified and did not identify that the latching deficiency still existed during subsequent transits through the door.

Inspection Report# : [2013002](#) (*pdf*)

**Significance:**  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Implement Compensatory Measures Associated with a Temporary Modification**

The inspectors identified an NCV of Technical Specification 6.4, "Procedures," because procedure OPOP-SW-2181, "Service Water/ Alternate Cooling System," was inadequate. Specifically, the step in the procedure to identify and isolate sources of water lost from the cooling tower basin would not have been implemented in a timely manner while a temporary fire water system was drawing on the basin. Entergy's corrective actions included writing a night order describing the fire fighting strategy for a fire in the intake and directing the temporary fire pumps to be stopped if they started automatically while the alternate cooling system (ACS) was in service, implementing temporary procedure changes, and initiating a condition report.

The finding is more than minor because it impacted the design control attribute of the Mitigating Systems cornerstone. Specifically, the temporary modification added another potential path for loss of water from the cooling tower deep basin and the appropriate compensatory measures to address that loss path were not implemented, impacting the capability and reliability of ACS. Additionally, the finding is similar to IMC 0612, Appendix E, "Examples of Minor Issues," example 3.j more than minor description, because the added draw on the cooling tower basin water had the potential to affect the accident analysis calculation assumption of the amount of water available for running ACS. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not involve the total loss of a safety function that contributes to external event initiated core damage accident sequences. This condition existed for less than the technical specification allowed outage time of seven days. This finding had a cross-cutting aspect in the area of human performance, Work Control, because Entergy did not appropriately coordinate work activities by incorporating actions to address the need to keep personnel apprised of the operational impact of work activities. Specifically, Entergy identified the need for compensatory measures for the temporary modification for the fire water system work, but the necessary actions were not coordinated to ensure operations and maintenance understood the

operational impact of the work.

Inspection Report# : [2013002](#) (*pdf*)

**Significance:**  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Corrective Action for Maintaining Operability of the Low Pressure Coolant Injection Battery UPS-1A**

The inspectors identified an NCV of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” because Entergy did not promptly correct an adverse condition resulting in the failure of the “B-UPS-1A” low pressure coolant injection (LPCI) uninterruptible power supply (UPS) battery. Specifically, Entergy personnel did not promptly replace a degraded battery cell prior to its exceeding operability limits. Entergy’s corrective actions included replacing cell 61, replacing all cells with individual cell voltages (ICVs) less than 2.13 V, expediting complete battery bank replacements with a due date of May 30, and initiating a condition report.

The finding is more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, UPS-1A had unplanned inoperability and degraded capacity due to cell 61 being out of service which commenced at some unknown point between December 3 and December 9 and was restored when cell 61 was replaced on December 10. In accordance with IMC 0609.04, “Initial Characterization of Findings,” and IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power,” the inspectors determined that this finding is of very low safety significance (Green) because it did not represent a loss of system safety function or a loss of safety function for a single train (UPS-1A and “A” LPCI) for greater than its technical specification allowed outage time (seven days). The inspectors determined that the finding had a cross-cutting aspect in the Problem Identification and Resolution area, Operating Experience component, because Entergy personnel did not implement and institutionalize available operating experience guidance contained within IEEE-450, “IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications,” or alternatively, vendor recommendations, to support plant safety.

Inspection Report# : [2013002](#) (*pdf*)

**Significance:**  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure of the “B” Emergency Diesel Generator from Jacket Water Leakage Due to Inadequate Corrective Action**

A self-revealing NCV of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” was identified because Entergy did not promptly correct an adverse condition resulting in the failure of the “B” EDG. Specifically, Entergy personnel did not promptly replace a degraded jacket water flange gasket prior to its subsequent failure. Entergy’s corrective actions included replacing the gasket, visually inspecting the other jacket water connections, and initiating a condition report.

The finding is more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the “B” EDG failed in service due to a known degraded condition that affected the overall system redundancy and reliability and resulted in 37 days of unplanned unavailability. The inspectors and a Region I Senior Reactor Analyst (SRA) completed the Detailed Risk Evaluation (DRE) in accordance with IMC 0609, Appendix A, “The Significance Determination

Process for Findings At-Power,” and determined this finding to be of very low safety significance (Green). The DRE estimated the increase in core damage frequency (?CDF) for internal initiating events in the range of 1 core damage accident in 2,000,000 years of reactor operation, in the mid-E-7 range per year. In addition, external initiating events such as fire, seismic and flooding would not have increased the total ?CDF above 1 E-6 per year, and the increase in the frequency of a large early release of radioactive material (?LERF) associated with the internal event ?CDF core damage sequences would not be above 1E-7 per year. The finding had a cross-cutting aspect in the Human Performance, Decision-Making, because Entergy personnel did not use conservative assumptions in decision making in that the chosen action was to monitor the leak for a prolonged period of time.

Inspection Report# : [2013002](#) (pdf)

## Barrier Integrity

**Significance:** G Jun 30, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Inadequate Procedure for Configuration Control Results in a Dislodged Secondary Containment Blowout Panel Due to Reactor Building Ventilation System Pressurization**

A self-revealing, Green, NCV of 10 CFR 50 Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified because Entergy did not establish a procedure controlling plant equipment appropriate to the circumstances for activities affecting quality. Specifically, the procedure for the control of plant equipment did not require identifying and tagging deenergized loads that continued to have control power such that reactor building ventilation was operated in a manner that dislodged an engineered blowout panel rendering secondary containment inoperable. Entergy’s corrective action to restore compliance consisted of implementing a night order to place a caution tag on the control switches of components that are deenergized and continue to have control power available.

The inspectors determined that Entergy’s failure to establish an adequate procedure for the control of plant equipment such that deenergized loads that continued to have control power were not identified or tagged was a performance deficiency that was reasonably within Entergy’s ability to foresee and correct and should have been prevented. This finding is more than minor because it is associated with the Procedure Quality attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents of events. Specifically, the lack of identification and/or tagging of the switches for “A” reactor building ventilation resulted in dislodging a secondary containment blowout panel rendering secondary containment inoperable. In accordance with IMC 0609.04, “Initial Characterization of Findings,” and IMC 0609, Appendix G, “Shutdown Operations Significance Determination Process,” issued February 28, 2005, the inspectors determined that this finding is of very low safety significance (Green) because it did not increase the likelihood of a loss of reactor coolant system inventory, did not degrade the ability to terminate a leak path or add reactor coolant system inventory, and did not degrade the ability to recover decay heat removal if it was lost. Specifically, at the time secondary containment was rendered inoperable, the reactor coolant system was fully flooded, the event did not increase the likelihood of any initiating event, and secondary containment was not required to be operable at the time given no fuel movement, core alterations, or operations with a potential for draining the reactor vessel in progress.

The inspectors determined that the finding had a cross-cutting aspect in the Human Performance, area, Resources component, because Entergy’s procedures did not ensure that components in the field were labeled sufficiently and completely during the bus deenergization to assure nuclear safety

Inspection Report# : [2013003](#) (pdf)

**Significance:**  Oct 16, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Dedicated Operators Required for Operability under Applied Administrative Controls Left Immediate Vicinity of Open Valves**

The inspectors identified an NCV of technical specification (TS) 6.4, "Procedures," for Entergy's failure to implement a surveillance activity in accordance with the written procedure. Specifically, the inspectors identified that during a surveillance test dedicated operators required to maintain operability of primary containment left the immediate vicinity of open manual containment isolation valves. Entergy's corrective actions included restoring the administrative controls required to maintain primary containment operability during the subject surveillance test, initiating condition report CR-VTY-2012-03561, sending a memorandum to and discussing the issue with all operating crew shift managers explaining the error and the requirements of a dedicated operator, and issuing a temporary night order further explaining these requirements. Additional corrective actions included implementing and tracking training for all operators on these requirements, and revising licensed operator training on primary containment to specifically describe these requirements.

The inspectors determined that the issue was more than minor because it is associated with the Human Performance attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the dedicated operators were required to be stationed in the immediate vicinity of the valve controls to rapidly close the valves when primary containment isolation is required during accident conditions, but the operators were significantly beyond the required immediate vicinity when they left the reactor building. The inspectors determined the significance of the finding using IMC 0609, Appendix H, "Containment Integrity Significance Determination Process." The finding was determined to be of very low safety significance (Green) using Appendix H, Table 6.2, "Phase 2 Risk Significance – Type B Findings at Full Power," because primary containment was inoperable for 37 minutes, i.e. less than 3 days. The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Resources component, because the training of personnel did not describe specific requirements of dedicated operators, including the definition of immediate vicinity. [H.2(b)]. (Section 1R22)

Inspection Report# : [2012004](#) (pdf)

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

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## **Public Radiation Safety**

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## Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

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