



Home > Nuclear Reactors > Operating Reactors > Reactor Oversight Process > Plant Summaries > Indian Point 3 > Quarterly Plant Inspection Findings

Indian Point 3 – Quarterly Plant Inspection Findings

2Q/2017 – Plant Inspection Findings

On this page:

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness
- Occupational Radiation Safety
- Public Radiation Safety
- Security

Initiating Events

Significance: G Oct 13, 2016

Identified By: Self-Revealing

Item Type: FIN Finding

345 kV Insulator Failure Causes Reactor Trip

A green self-revealing finding of ENN-EP-G-004, "Switchyard and Large Power Transformer Preventive Maintenance Guidelines," occurred in that preventive maintenance (PM) was not performed as required on the W96 345kV line insulators. Specifically, the semi-annual corona surveys to identify degradation of insulators were not performed for line W96, which led to an insulator failure and resulted in an automatic trip of the reactor. Entergy replaced the damaged insulator and added the W96 line to the corona survey PM work order.

Inspectors determined that Entergy did not perform PMs in accordance with ENN-EP-G-004, "Switchyard and Large Power Transformer Preventive Maintenance Guidelines," on the 345kV insulators, which is a performance deficiency that was reasonably within Entergy's ability to foresee and correct and should have been prevented. Specifically, the lack of PMs on the insulators allowed the insulators to degrade to a point where the condition of the insulator combined with environmental conditions led to a flashover event and a reactor trip. This finding is more than minor because it is associated with the Initiating Events cornerstone attribute of equipment performance, and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure of the insulator led to a reactor trip. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 1 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that this finding was of very low safety significance (Green) because the finding did not cause both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors determined that the finding had a cross-cutting aspect in Human Performance, Avoid Complacency, because Entergy did not recognize and plan for the possibility of mistakes, latent issues, and inherent risk. Specifically, Entergy performed a site review ensuring appropriate PMs were in place, and did not identify that the PM for the insulator was

not being performed.

Inspection Report# : 2016009 (*pdf*)

Mitigating Systems

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Operation in Mode 1 with Pressurizer Code Safety Valves in an Inoperable Condition

The inspectors identified an NCV of very low safety significance of Technical Specification (TS) 3.4.10, "Pressurizer Safety Valves," when two of three pressurizer code safety valves, RC-PCV-464 and RC-PCV-468, were reported to have failed surveillance test 3.4.10.1 on July 1, 2015, at Wylie Laboratory. Entergy reported these failures under Unit 3 licensee event reports (LERs) 2015-006-00 and 2015 006 01, and concluded that Unit 3 had violated TS 3.4.10, Condition B. Entergy had failed to evaluate three prior test failures from RC-PCV-468 and recognized that RC-PCV-468 had degraded reliability. As a result, Entergy elected not to reinstall RC-PCV-468 at the end of the current outage (condition report (CR) IP3 2017 0913).

The inspectors determined that failing to correlate the symptoms and identify the cause for the repeated failure history of valve RC-PCV-468 over the last ten years resulted in a reported violation of TS 3.4.10 as reported in LERs 2015-006-00 and 2015-006-01. RC PCV-468 was reinstalled in the system in 2012 and subsequently failed its lift setpoint test in 2015. The performance deficiency was determined to be more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely impacts the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was determined to be of very low safety significance (Green) because the small increase (5 percent) in the lift setpoint of the safety valves would not have prevented the valve from failing to relieve and, therefore, the failed surveillance test did not represent a loss of safety function. The inspectors concluded this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, because Entergy did not thoroughly evaluate the failure history to address causes and extent of conditions commensurate with their safety significance.

Inspection Report# : 2017001 (*pdf*)

Significance:  Dec 31, 2016

Identified By: NRC

Item Type: FIN Finding

Inadequate Preventive Maintenance Classification of Starting Air Relief Valve Led to Failure

The inspectors identified a finding of very low safety significance because Entergy did not correctly classify relief valve DA-5-2 as a high critical component. DA-5-2 is a relief valve in the emergency diesel generator (EDG) air start system; and when it failed in service due to an inadequate preventive maintenance frequency, it caused a loss of air that depressurized the air start system, rendering it inoperable. Entergy took corrective action to replace the failed relief valve and wrote CR-IP3-2016-03851 to review the classification of DA-5-2.

This performance deficiency was more than minor because it was associated with the Mitigating Systems cornerstone and affected the equipment performance attribute. Specifically, the failure of the relief valve reduced the air available for starting the 32 EDG and reduced its reliability. The inspectors performed a risk screening in accordance with IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The finding was of very low safety significance (Green) because it did not represent an actual loss of function of a single train for greater than its TS allowed outage time. Specifically, the air pressure in the starting air tank was below the TS limit for less than an hour,

and the allowed outage time for the starting air tank is 48 hours. The inspectors determined that there was no cross-cutting aspect associated with this finding because it is not associated with current performance. Specifically, the decision to extend the preventive maintenance frequency was made in 2010, and there had been no other failures of similar components since then that would have prompted Entergy to review the basis for that decision.

Inspection Report# : 2016004 (*pdf*)

Significance:  Dec 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Operability Evaluation of Leak in Service Water Pump Discharge Pipe

The inspectors identified an NCV of very low safety significance of Title 10 of the Code of Federal Regulations (10 CFR) 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Entergy staff did not perform an adequate operability review under EN-OP-104, "Operability," for a service water (SW) piping leak described in CR IP3-2016-1113. Entergy based the flooding portion of the operability review on the assumption that a non-safety-related sump pump would function to prevent flooding of the room, although under accident conditions it would not have electrical power. Entergy implemented corrective actions to revise their operability evaluation and also installed a housekeeping patch that greatly reduced the leak rate.

The performance deficiency was determined to be more than minor because the finding was similar to Example 3j of NRC IMC 0612, Appendix E, "Examples of Minor Issues," in that incorrect assumptions of the ability of the Zurn pit sump pump to remove the water resulted in reasonable doubt regarding operability and warranted additional evaluation. This issue impacts the protection against the external factors attribute of the Mitigating Systems cornerstone and impacts its objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Entergy did not properly evaluate the operability impacts of an increase in the leak rate from a preexisting SW leak in the Zurn strainer pit and, therefore, did not implement compensatory measures to prevent internal flooding in the event the installed, non-safety-related sump pump failed. The inspectors determined the finding could be evaluated using the Significance Determination Process, Attachment 0609.04, "Initial Characterization of Findings." Because the finding impacted the Mitigating Systems cornerstone, the inspectors screened the finding through IMC 0609 Appendix A, "The Significance Determination Process for Findings At-Power," using Exhibit 2, "Mitigating Systems Screening Questions." The finding required a detailed risk evaluation because it represented the potential loss of the entire SW system. A detailed risk assessment was conducted assuming that a loss of offsite power (LOOP) could challenge the functionality of the SW system due to flooding impacts on the system strainers. The resulting change in core damage frequency was estimated to be in the mid E-6 range, Green. The inspectors concluded this finding had a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because Entergy did not recognize and plan for the possibility of latent issues and inherent risk. Entergy had experienced numerous SW system leaks that remained small and did not plan for the possibility that this one would increase. Once the leak had increased significantly, Entergy did not appropriately revise the operability determination to reflect the changed circumstances and take appropriate compensatory measures to promptly restore operability.

Inspection Report# : 2016004 (*pdf*)

Significance:  Dec 31, 2016

Identified By: NRC

Item Type: FIN Finding

Failure to Provide Indication of a Bypassed RPS Channel During Testing

The inspectors identified a finding of very low safety significance when Entergy conducted testing on the Unit 3 reactor protection system (RPS) that was contrary to the guidance in IEEE standard 279-1968, a standard to which Indian Point Unit 3 was committed. Specifically, Entergy made temporary changes to their Unit 3 reactor coolant temperature channel functional test procedures, pressurizer pressure loop functional test procedures, and nuclear power range

channel axial offset calibration procedures to use jumpers to bypass RPS trip functions, without meeting the requirement to have continuous indication in the control room when a part of RPS is bypassed for any purpose. Entergy closed the temporary modification and returned to testing without using jumpers to bypass the tested channel.

The inspectors determined the finding was more than minor because this finding was associated with the procedure quality attribute of the Mitigating Systems cornerstone and affected its objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the new test method reduced the reliability of the RPS tripping the unit under conditions requiring an overtemperature delta temperature (OTDT) trip. The inspectors evaluated this finding using IMC 0609, Attachment 4, "Initial Characterization of Findings." The inspectors determined that the finding affected the Mitigating Systems cornerstone and evaluated the finding using Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The finding is of very low safety significance (Green) because it did not affect both the RPS trip signal to initiate a reactor scram and the function of other redundant trips or diverse methods of reactor shutdown. The inspectors identified a cross-cutting aspect in the area of Human Performance, Conservative Bias, because Entergy did not determine the test method was safe in order to proceed. Specifically, Entergy staff rationalized that the use of jumpers was allowable because they were focused on completing the required surveillance testing.

Inspection Report# : 2016004 ([pdf](#))

Significance:  Sep 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Adequately Assess Fire Risk Associated with Maintenance on the Unit 3 Appendix R Diesel Generator

The inspectors identified a Green NCV of Title 10 of the Code of Federal Regulations (10 CFR) 50.65(a)(4) because between August 1, 2016, and August 17, 2016, Entergy did not perform an adequate risk assessment for the maintenance on the Unit 3 Appendix R diesel generator (ARDG). As a result, they did not take the required risk mitigating actions (RMAs). Entergy wrote Condition Report (CR) IP3 2016 2538, changed fire risk status to Yellow, and began implementing RMAs on August 17, 2016.

The inspectors determined that this performance deficiency was more than minor because it is associated with the Protection Against External Factors attribute of the Mitigating Systems cornerstone and adversely affected its objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, due to the inadequate risk assessment, Entergy did not perform shiftly walkdowns for transient combustibles and related fire and ignition sources on the available safe shutdown train. Using IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," the inspectors determined that the failure to conduct RMAs for the unavailability of the ARDG required further assessment. A Region I senior reactor analyst (SRA) used SAPHIRE, Revision 8.1.14, and the Indian Point Unit 3 Standardized Plant Analysis Risk (SPAR) Model, Revision 8.20, to complete an evaluation this performance deficiency. The incremental conditional core damage probability (ICCDP) for this finding was calculated to be less than 1E-7 or very low safety significance (Green). This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Identification, because Entergy did not identify that an improperly racked-in breaker had a fire risk impact when combined with other plant conditions.

Inspection Report# : 2016003 ([pdf](#))

Significance:  Sep 20, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Untimely Corrective Actions for Degraded Automatic Voltage Regulator Card

The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because

Entergy did not take timely corrective action to perform an inspection of the 33 EDG AVR card. As a result, the degraded solder connections on the card were not repaired for an excessive period of time. Entergy repaired the solder joints on the AVR card in the 33 EDG and wrote CR-IP3-2016-3018.

This performance deficiency was more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected its objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. The existence of degraded solder joints on the AVR card decreases the reliability of the EDG, and the untimely corrective action allowed the degradation to exist for longer than necessary without being corrected. In accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," the inspectors determined that the finding was of very low safety significance (Green) because the 33 EDG maintained its operability or functionality, it did not represent a loss of system or function, and it did not involve external mitigation systems. The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Conservative Bias, because leaders did not take a conservative approach to decision making, particularly when information is incomplete or conditions are unusual. Specifically, Entergy did not inspect the 33 EDG AVR cards at the first available opportunity due to resource constraints.

Inspection Report# : 2016003 (*pdf*)

Significance:  Jul 20, 2012

Identified By: NRC

Item Type: VIO Violation

Failure to Protect Safe Shutdown Equipment from the Effects of Fire

The inspectors identified a finding of very low safety significance (Green), involving a cited violation of Indian Point Unit 3 Operating License Condition 2.H to implement and maintain all aspects of the approved fire protection program. Specifically, ENO failed to protect required post-fire safe shutdown components and cabling to ensure one of the redundant trains of equipment remained free from fire damage as required by 10 CFR Part 50, Appendix R, Section III.G.2. In lieu of protecting a redundant safe shutdown train, ENO utilized unapproved operator manual actions to mitigate component malfunctions or spurious operations caused by postulated single fire-induced circuit faults. ENO submitted an exemption request (M1090760993) on March 6, 2009, in which it sought exemption from requirements of Paragraph III.G.2, to permit the use of OMAs upon which it had been relying for safe-shutdown in a number of fire areas. However, several OMAs within the exemption request were denied because ENO failed to demonstrate that the OMAs were feasible and reliable, or to appropriately evaluate fire protection defense-in-depth. ENO's performance deficiency delayed achieving full compliance with fire protection regulations and adversely affected post-fire safe shutdown. ENO has entered this issue into the corrective program for resolution. The inspectors found the manual actions in addition to roving fire watches in all affected areas to be reasonable interim compensatory measures pending final resolution by ENO.

ENO's failure to protect components credited for post-fire safe shutdown from fire damage caused by single spurious actuation is considered a performance deficiency. The performance deficiency was more than minor because it affected the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to an external event to prevent undesirable consequences in the event of a fire. Specifically, the use of operator manual actions during postfire safe shutdown is not as reliable as normal systems operation which could be utilized had the requirements of 10 CFR 50, Appendix R, Section III.G.2 been met and, therefore, prevented fire damage to credited components and/or cables. The inspectors used IMC 0609, Appendix F, Fire Protection Significance Determination Process, Phase 1 and a Senior Reactor Analyst conducted a Phase 3 evaluation, to determine that this finding was of very low safety significance (Green). This finding does not have a cross cutting aspect because the performance deficiency occurred greater than three years ago when the exemption request was submitted to the NRC on March 6, 2009, and is not indicative

of current licensee performance.

Inspection Report# : 2012008 (*pdf*)

Barrier Integrity

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Standard Operation Procedure for the Backup Spent Fuel Pool Cooling System

The inspectors identified an NCV of very low safety significance of TS 5.4, "Procedures," because Entergy did not adequately establish and maintain procedure 3-SOP-SFP-003, "Operation of the Backup Spent Fuel Pool Cooling (BSFPC) System." The updated final safety analysis report (UFSAR) for Unit 3 included several administrative controls for the use of the BSFPC system as the sole source of cooling to the fuel pool; and some of these controls were not captured in 3 SOP SFP 003 and, therefore, were not implemented. Entergy wrote CR IP3-2017-00510 to enter this concern into their corrective action program (CAP).

The inspectors determined that failing to include all of the administrative controls in procedure 3-SOP-SFP-003 was a performance deficiency. This performance deficiency was more than minor because it is associated with the Procedure Quality attribute of the Barrier Integrity cornerstone; and if the condition was left uncorrected, the latent equipment issues in the system could have resulted in an undetected or uncorrectable loss of spent fuel pool (SFP) cooling. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 3 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green) because it did not cause the SFP temperature to exceed the maximum analyzed temperature limit specified in the licensing basis. This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, because when Entergy improved 3-SOP-SFP-003 in response to other identified procedural deficiencies, they did not capture the missing administrative controls in their extent of condition.

Inspection Report# : 2017001 (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Security

The security cornerstone is an important component of the ROP, which includes various security inspection activities the NRC uses to verify licensee compliance with Commission regulations and thus ensure public health and safety. The Commission determined in the staff requirements memorandum (SRM) for SECY-04-0191, "Withholding Sensitive Unclassified Information Concerning Nuclear Power Reactors from Public Disclosure," dated November 9, 2004, that specific information related to findings and performance indicators associated with the security cornerstone will not be publicly available to ensure that security-related information is not provided to a possible adversary. Security inspection report cover letters will be available on the NRC Web site; however, security-related information on the details of inspection finding(s) will not be displayed.

Miscellaneous

Current data as of : August 03, 2017

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