

Saint Lucie 2

4Q/2009 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Safety-Related Maintenance Procedure to Properly Align the 2B2 Reactor Coolant Pump/Motor Shaft Coupling Assemblies

An inspector identified non-cited violation of Technical Specification 6.8.1.a and Regulatory Guide 1.33 was identified for an inadequate safety-related maintenance procedure. Specifically, the inspectors identified that during reassembly of Reactor Coolant Pump (RCP) 2B2 in July 2009 mechanical maintenance procedure MMP-01.17, "Reactor Coolant Pump Model N-9000 Seal Removal and Installation," Revision 10, instructed the licensee to utilize a method of checking the RCP coupling alignment that was not in accordance with Byron Jackson Technical Manual 741-N-0001/4, Revision 23. The procedure instructed the maintenance workers to measure the shaft coupling flange face gap clearance rather than measuring the concentricity/runout of the coupling flanges as required in the subject vendor technical manual. This resulted in the RCP running with increased vibrations and ultimately requiring a plant shutdown to perform repairs. This issue was entered into the Corrective Action Program (CAP) as Condition Reports 2009-28512 and 2009-22728

This finding is more than minor because it is associated with procedure quality attribute and affected the objective of the Reactor Safety/Initiating Event Cornerstone to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the subject RCP maintenance procedure did not require the measurement of coupling run-out whenever the coupling is disassembled in accordance with the vendor technical manual requirements which resulted in an unplanned plant shutdown. The finding was determined to be of very low safety significance since it did not contribute to both the likelihood of a reactor trip and that mitigation equipment or functions would not be available. The inspectors determined that the cause of this finding has a crosscutting aspect in the area of human performance associated with the resources attribute, in that the maintenance procedure instructions were not complete or accurate to ensure proper RCP coupling alignment. (IMC 0305 aspect H.2.c). (Section 40A2.2)

Inspection Report# : [2009005](#) (*pdf*)

Significance:  Jun 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Follow Procedure When Placing Shutdown Cooling In-service

A self-revealing NCV of Technical Specification (TS) 6.8.1.a and Regulatory Guide (RG) 1.33 was identified for the licensee failing to implement a written procedure for general plant operations. The normal operating procedure 2-NOP-03.05, "Shutdown Cooling," was not implemented as written when drain valve V7207 was mistakenly closed by a non-licensed building operator when it was required to be open when placing the 'A' shutdown cooling train in service. Specifically, the closing of valve V7207 removed a required drain path for known valve seat leakage past containment spray boundary valve 2-MV-07-03 which resulted in unplanned adjacent intersystem leakage into the containment spray system from the reactor coolant system. This issue was entered in the licensee's corrective action program as CR 2009-15198.

The finding was more than minor because it affected the Configuration Control attribute of the Initiating Events cornerstone and the valve misposition could be reasonably viewed as a precursor to a significant event. Using the NRC Manual Chapter 0609, ASignificance Determination Process, @ Appendix G, "Shutdown Operations Significance Determination Process," Checklist 3, the finding was determined to be of very low safety significance because Core Heat Removal, Inventory Control, Power Availability, Containment Control, and Reactivity Guidelines

were all met. A contributing cause of the finding is related to the cross-cutting area of Human Performance, with a work practices component. Specifically, the operator failed to implement expected human error prevention techniques such as procedure place keeping and self-checking to ensure the valve was positioned properly, [H.4(a)]. (Section 40A2.2)

Inspection Report# : [2009003](#) (pdf)

Significance:  Jun 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Have a Fully Qualified and Active Licensed Operator at the Control Boards During Reactivity Manipulations

A self-revealing Non-Cited Violation (NCV) of 10 CFR 50.54(i), Conditions of Licenses, for failure to have a fully qualified and active licensed operator at the control boards during reactivity manipulations. On June 7, 2008, the Shift Manager (SM) of record allowed an inactive licensed Senior Reactor Operator (SRO) to manipulate the controls that directly affected a reactor's power level / reactivity. The SM understood that the available licensed SRO was in an inactive status and decided that the inactive licensed SRO would conduct reactivity manipulations under the direct observation of an active reactor operator while the Unit Supervisor directed these activities. Since the inactive licensed SRO had not performed the functions of an SRO for a minimum of seven 8-hour shifts or five 12-hour shifts per calendar quarter, as required by 10 CFR 55.53(e), he was ineligible to perform or direct licensed activities. The issue was documented in the licensee's corrective action program as CRs 2008-19417 and 19830.

The finding was more than minor because it affected the Human Performance attribute of the Initiating Events cornerstone and allowing the inactive SRO to be involved in power changes/reactivity manipulations without having an active license could be reasonably viewed as a precursor to a significant event. Additionally, if left uncorrected, this deficiency has the potential to lead to a more significant safety concern. The finding was evaluated using the NRC Manual Chapter 0609, A Significance Determination Process, @ Appendix M, and was determined to be of very low safety significance because the finding did not involve any negative events as a result of SM being in an inactive status. No cross-cutting aspect associated with this finding was identified. (Section 40A5.3)

Inspection Report# : [2009003](#) (pdf)

Significance:  Mar 31, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Implement Adequate Process Controls during Maintenance Activities Resulted in a Manual Reactor

A self-revealing finding was identified for failure to implement adequate process controls to minimize risk during maintenance on the Unit 2, 5B feedwater heater high level limit switch resulting in a manual reactor trip on June 4, 2008. No violations of NRC requirements were identified because the feedwater heater drain system is non-safety related. The licensee entered the issue into the corrective action program as condition report (CR) 2008-18858. Corrective actions included development of specific procedural direction for controlling and insulating energized control circuit leads during work evolutions using the risk management process, design modifications to address vulnerability when performing maintenance on level switches, and evaluation of industry best practices for training and handling of energized leads.

The finding was more than minor because it resulted in a manual reactor trip. The finding was associated with the human performance attribute and affected the Initiating Events cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as at power operations. Using the NRC Manual Chapter 0609, a Significance Determination Process, Attachment 609.04, Phase 1 screening worksheet, the finding was determined to be of very low safety significance because it was a transient initiator but did not increase the likelihood that mitigation equipment would not be available. The cause of the finding is related to the cross-cutting area of Human Performance, with a work control component. Specifically, the licensee did not adequately plan work activities to minimize the risk of grounding the energized leads (H.3(a)).

Mitigating Systems

Significance:  Dec 03, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Meet the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 Requirements for the Overpressure Protection for the CCW Surge Tank .

The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion III, Design Control, for failure to translate the design basis as specified in the license application into specifications, drawings, procedures, and instructions. The licensee did not ensure that the component cooling water (CCW) surge tank design included adequate overpressure protection for all procedurally allowed configurations as required by the applicable ASME Boiler and Pressure Vessel Code, Section VIII, Division 1. The code requires that no intervening stop valves be between the vessel and its protective device or devices or between the protective devices and the point of discharge. The team concluded that stop valve V6466 was an intervening stop valve for the CCW surge tank vent path to the chemical drain tank (CDT). The issue was entered in the licensee's corrective action program as condition report (CR) 2009-23473. Immediate licensee corrective actions included verification that the valve was in its open position and the implementation of administrative controls to maintain the valve open.

This finding is associated with the Mitigating Systems Cornerstone attribute of Design Control, i.e. initial design, was determined to be more than minor because it impacted the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team determined that if left uncorrected, this design deficiency had the potential to impact the operability of safety-related systems and, thus, become a more significant safety concern in that a closed intervening valve had the potential for overpressurizing the CCW surge tank. The team assessed this finding for significance in accordance with NRC Manual Chapter 0609, Appendix A, Attachment 1, Significance Determination Process (SDP) for Reactor Inspection Findings for At-Power Situations, and determined that it was of very low safety significance (Green), in that no actual loss of safety system function was identified. The team reviewed the finding for cross-cutting aspects and concluded that this finding did not have an associated cross-cutting aspect because the design of the CCW surge tank relief was established in an original plant design, and therefore, was not representative of current licensee performance. [Section 1R21.2.2]

Inspection Report# : [2009006](#) (pdf)

Significance:  Dec 03, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Maintain the Safety-Related 125V DC System Design Basis Information Consistent with the Plant Configuration

The inspectors identified a finding involving a violation of 10 CFR 50, Appendix B, Criterion III, Design Control, for the licensee's failure to maintain the safety-related 125V DC system design basis information consistent with the plant configuration. Specifically, a revision to the Unit 1, safety-related 125V DC system analysis incorporated incorrect design input specifications. The issue was entered in the licensee's corrective action program as CR 2009-24517. Licensee corrective actions included incorporating the correct design input and specifications by revising the calculations.

The finding was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Design Control. It impacted the cornerstone objective because if left uncorrected, it had the potential to lead to a more significant safety concern in that future design activity or operability assessments would assume the lower voltage (100V DC vs. actual 105V DC) value acceptable for assuring the adequacy of voltage to the safety-related inverters. The team assessed this finding for significance in accordance with NRC Manual Chapter 0609, using the Phase I SDP

worksheet for mitigating systems and determined that the finding was of very low safety significance (Green) since it was a design deficiency determined not to have resulted in a loss of safety function. This finding has a cross-cutting aspect in the area of human performance because the licensee failed to ensure that procedures (specifically ENG-QI 1.5) were available and adequate to assure nuclear safety (specifically, complete, accurate and up-to-date design documentation): H.2(c). [Section 1R21.2.20]

Inspection Report# : [2009006](#) (pdf)

Significance: TBD Dec 03, 2009

Identified By: NRC

Item Type: AV Apparent Violation

Failure to Translate Design Basis Specifications to Prevent Single Failure of CCW

The team identified an AV of 10 CFR 50, Appendix B, Criterion III, Design Control, for the licensee's failure to identify that the CCW system met its license specifications related to common cause failure vulnerabilities. Specifically, a non-safety system failure (i.e. waste gas compressor aftercoolers affecting both units, or containment IA compressors affecting Unit 1 only) could result in a common cause failure of both trains of a safety system (i.e. CCW system). The issue was entered into the licensee's corrective action program as CR 2009-22929 with actions to evaluate the past operability of the CCW system during the air intrusion event. Licensee corrective actions included isolating the CCW system from the containment IA compressors.

The finding was determined to be more than minor because if left uncorrected, it could affect the availability, reliability and capability of a safety system to perform its intended safety function. Specifically, with this vulnerability, a failure of the waste gas aftercooler (both units) or a failure of the containment IA compressors (Unit 1 only) could cause air intrusion into the CCW system and lead to a loss of CCW event, therefore, failing to ensure that adequate cooling would be available or maintained to essential equipment used to mitigate design bases accidents. The finding was assessed for significance in accordance with NRC Manual Chapter 0609, using the Phase I and Phase II SDP worksheets for mitigating systems. It was determined that a Phase III analysis was required since this finding represented a potential loss of safety system function for multiple trains which was not addressed by the Phase II pre-solved tables/worksheets. Based on the Phase III SDP, the finding was preliminarily determined to be greater than Green. The team reviewed the finding for cross-cutting aspect and concluded that this finding did not have an associated cross-cutting aspect because the design of the CCW system was established in an original plant design, and therefore, was not representative of current licensee performance. [Section 40A5]

Inspection Report# : [2009006](#) (pdf)

Significance: TBD Dec 03, 2009

Identified By: NRC

Item Type: AV Apparent Violation

Failure to Identify and Correct a Condition Adverse to Quality such that Non-Safety Related System Could Cause a Common Mode Failure of Both Trains of a Safety-Related System

The team identified an AV of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to implement adequate corrective actions associated with the CCW air intrusion event that occurred in October, 2008. The corrective actions were inadequate in that the licensee failed to identify and correct the cause of air intrusion. The issue was entered in the licensee's corrective action program as CR 2009-25209 to address the ineffective corrective actions for the air intrusion event. Licensee corrective actions included isolating the CCW system from the containment IA compressors.

The finding was determined to be more than minor because it affected the availability, reliability and capability of a safety system to perform its intended safety function. Specifically, without knowing the leak path from the containment IA compressors to the CCW system, the licensee could not ensure that adequate cooling would be available or maintained to essential equipment used to mitigate design bases accidents. The finding was assessed for significance in accordance with NRC Manual Chapter 0609, using the Phase I and Phase II SDP worksheets for mitigating systems. It was determined that a Phase III analysis was required since this finding represented a loss of safety system function for multiple trains which was not addressed by the Phase II pre-solved tables/worksheets. Based on the Phase III SDP, the finding was preliminarily determined to be greater than Green. This finding was determined to have a cross-cutting aspect in the area of Human Performance, Decision Making, specifically H.1(a). [Section 40A5]

Inspection Report# : [2009006](#) (pdf)

Significance:  Jun 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Risk Assessment When Performing Weekly Pump Venting

The inspectors identified NCV of 10 CFR 50.65 (a)(4) when the licensee did not perform an adequate risk assessment which resulted in an underestimation of the associated risk while performing weekly Emergency Core Cooling System (ECCS) pump venting. On April 20, 2009, the inspectors were reviewing the Unit 2 control room chronological logs and noted that during the weekly High Pressure Safety Injection (HPSI) pump venting, the assessed risk using the Online Risk Monitor (OLRM) was recorded as green (low) instead of the required yellow (medium). During the venting evolution, the HPSI pump hand switch is taken to STOP rendering the pump incapable of performing its safety-related function to automatically inject water into the RCS, thereby requiring entry into the associated TS Action Statement and yellow OLRM risk determination. The issue was entered in the licensee's corrective action program as CR 2009-12037.

The finding was more than minor because it affected the Human Performance attribute of the Mitigating Systems cornerstone and using MC 0612, Appendix E, Example 7.e, because if the overall risk had been correctly assessed, it would have placed both units' into a higher risk category. The finding was evaluated in accordance with MC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process (SDP)," and determined to be of very low safety significance (Green), using Flowchart 1. This determination was based on the incremental core damage probability deficit being less than 1E-6 for the given condition of the HPSI pumps being out of service during the weekly pump venting. This finding has a crosscutting aspect in the area of human performance, component of work control because the licensee did not incorporate appropriate risk insights when planning maintenance that effects the OLRM value. [H.3(a)]. (Section 1R13).

Inspection Report# : [2009003](#) (pdf)

Significance:  Apr 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Correct Conditions Adverse to Quality

The team identified two examples of a non-cited violation of St. Lucie's Unit 1 and Unit 2 Operating License Conditions 3.E for the licensee's failure to promptly correct conditions adverse to quality. The first example involved failure to take prompt corrective action for a noncompliance that was identified during the 2006 triennial fire protection inspection (Inspection Report 05000335, 389/2006010). Specifically, the licensee did not implement corrective actions to perform surveillance tests on the Unit 1 eight-hour battery powered portable emergency lights. The second example identified by the team during the 2009 inspection, involved four eight-hour battery powered fixed emergency lights that failed an annual surveillance test and were not repaired or replaced. The licensee initiated Condition Reports 2009-4010, -4056 and -4220 to implement corrective actions to address these issues.

The licensee's failure to correct the above conditions adverse to quality involving fire protection, as required, was a performance deficiency. The finding is more than minor because it is associated with the reactor safety, mitigating systems, cornerstone attribute of protection against external factors (i.e., fire) and it affects the objective of ensuring reliability and capability of systems that respond to initiating events. The team determined that this finding was of very low safety significance (Green) because the operators had a high likelihood of completing the task using flashlights. This performance deficiency is associated with the cross-cutting area: Human Performance, Work Control: H.3(b). The finding was directly related to the licensee not planning and coordinating work activities to support long-term equipment reliability and their maintenance scheduling was more reactive than preventive. (Section 1R05)

Inspection Report# : [2009007](#) (pdf)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

Last modified : March 01, 2010