

Crystal River 3

4Q/2009 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Manual Reactor Trip Due to Group 7 Control Rods Insertion Caused by Inadequately Protected Test Jumper (Section 40A3.3)

A self-revealing NCV of Improved Technical Specification (ITS) 5.6.1.1.a was identified for the failure to follow the provisions of preventative maintenance procedure PM-126, Electrical Checks of CRD [Control Rod Drive] Power Train. Failure to follow PM-126 caused the failure of the Group 7 control rod programmer during maintenance and resulted in the unexpected insertion of the Group 7 control rods fully into the core. This unexpected insertion of these control rods into the core caused control room operations personnel to manually trip the reactor from 100 percent power. The licensee entered this issue into the corrective action program as NCR 351705.

This finding was determined to be more than minor because it was associated with the initiating events cornerstone attribute of Human Performance, and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during at power operations. The finding was evaluated using Phase 1 of the At-Power SDP, and was determined to be of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment or functions were not available. The cause of this finding was directly related to the cross-cutting area of Human Performance with a work practices aspect (H.4 (b)). Specifically, the workers failed to follow the preventative maintenance procedure. (Section 40A3.3)

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

Significance:  Mar 31, 2009

Identified By: Self-Revealing

Item Type: FIN Finding

Inadequate Peer and Peer Checking Resulted in Connecting Improper Test Equipment and a Manual Plant Trip

A self-revealing finding was identified for the failure to follow procedure HUM-NGGC-0001, Human Performance Program, which required workers to perform self and peer checks to ensure the correct action is performed on the correct component. Specifically, during meter calibration activities, workers performing voltage checks failed to perform adequate self and peer checks when connecting test equipment. As a result, incorrect test equipment was connected resulting in blown fuses, the loss of several secondary plant pumps, and ultimately a manual plant trip. Corrective actions include: move relay work identified in the extent of condition review from on-line to outage to prevent recurrence, revise maintenance procedures associated with calibration of meters and relays to incorporate human factoring from lessons learned from this event, and perform an analysis of and incorporate best practices in procedures regarding how plant risk is assessed for activities that could cause transients.

The finding was more than minor since it affected the human performance attribute of the Initiating Event Cornerstone and resulted in an event that upset plant stability. Specifically, the failure to properly utilize human performance tools such as self and peer checking as specified in HUM-GGC-0001, Revision 2, resulted in the connection of incorrect test equipment, the loss of several secondary plant pumps and ultimately led to a manual reactor trip. The inspectors assessed the finding using the SDP and determined that the finding was of very low safety significance (Green) since it did not contribute to the likelihood of a loss of coolant accident, did not contribute to a loss of mitigation equipment, and did not increase the likelihood of a fire or internal/external flood. The cause of the finding is related to the cross-cutting area of Human Performance with a work practices aspect (H.4(a)). Specifically, workers did not utilize proper self and peer checking.

Mitigating Systems

Significance:  Dec 31, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Follow a Plant Procedure Resulted in an Inoperable HPI System

A self-revealing Non-Cited Violation (NCV) of Improved Technical Specification (ITS) 5.6.1.1.a was identified for the failure to follow a plant procedure which resulted in a loss of a 480 volt engineered safeguards motor control center (ES MCC)-3B1. Concurrent with pre-existing conditions, the high pressure injection (HPI) system was declared inoperable and ITS 3.0.3 was entered for a period of one hour and 24 minutes. The licensee entered this issue into the corrective action program as nuclear condition report (NCR) 333515.

The finding was more than minor since it affected the equipment availability attribute of the mitigating system cornerstone and resulted in ITS 3.0.3 entry for the HPI system being inoperable. The finding was evaluated against NRC Phase 1 Significance Determination Process (SDP) and Phase 2 SDP was required due to a loss safety function of the HPI system. A Regional Senior Reactor Analyst performed a Phase 3 SDP evaluation and concluded this finding was of very low safety significance (Green). The major assumptions of the evaluation were that the HPI function was out of service for exposure period (1 .5 hours) and there would be no recovery of the de-energized motor control center. The dominant accident sequence involved a support system failure of the Emergency Feedwater (EF) Indication and Control System rendering Main Feedwater and automatic control of EF unavailable, operators were unable to manually control EF flow causing its failure and with the HPI function lost due to the performance deficiency, core damage ensued. The inspectors determined the cause of the finding is related to the cross-cutting area of Human performance with a work practices aspect H.4 (c)). Specifically, work scope changes involving safety-related equipment did not receive the appropriate level management oversight resulted in a plant procedural violation. (Section 4OA3.2)

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

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Risk Assessments When Performing Surveillance Testing

The inspectors identified a non-cited violation (NCV) of 10 CFR 50.65(a)(4) for the failure to perform adequate risk assessments associated with a number of surveillance tests. Specifically, it was determined that risk assessments were not being properly performed for equipment that became unavailable as a result of surveillance testing. This condition has existed since implementation of the Equipment out of Service (EOOS) risk assessment software more than 10 years ago. Short term corrective actions include performance of additional peer reviews of upcoming performance and surveillance tests (PTs and SPs) to ensure they are included in the plant risk assessment and a similar independent review by the corporate probabilistic risk assessment staff. Long term corrective actions include: screen all SPs and PTs to evaluate for risk impact; develop a methodology to include risk significant SPs and PTs in the plant risk assessment, either automatically from the work schedule or a manual process; incorporate risk assessment process changes in licensee procedures; and provide additional EOOS training to the plant staff.

Utilizing IMC 0612, Appendix B, Issue Screening, the finding was determined to be more than minor since licensee risk assessments failed to consider risk significant systems and support systems that were unavailable during maintenance. In order to determine the risk significance of this finding, the inspectors selected two recently performed surveillance procedures for two high risk systems that were not included in the licensee's risk assessment. The SPs selected were decay heat system (DHR) SP-340B, DHP-1A, BSP-1A and Valve Surveillance and emergency feedwater (EFW) system SP-146A, EFIC Monthly Functional Test (During Modes 1, 2, 3). The risk deficit for SP-340B was determined to be less than 1E-6 incremental core damage probability deficit (ICDPD). The risk associated

with SP-146A was not quantified since it was determined that the system did not lose its functionality during the SP. Utilizing IMC 0609, Appendix K, Maintenance Risk Assessment and Risk Management Significance Determination Process (SDP), Flow Chart 1, the finding was determined to be of very low safety significance. This finding was not assigned a cross cutting aspect since the issue existed for greater than 10 years and is not indicative of current licensee performance.

Inspection Report# : [2009004](#) (pdf)

Significance: G Mar 31, 2009

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to Have Adequate Controls in Place to Ensure the Temperature of the Emergency Diesel Room was Maintained to Support EGDG Operability

A self-revealing finding was identified for failing to have adequate controls in place to ensure the temperature of the emergency diesel room was maintained to support emergency diesel generator (EGDG) operability. As a result, during cold weather conditions, licensee personnel did not close an access door which caused a low EGDG-1B lube oil temperature condition and inoperability of the EGDG. Corrective actions include: posting signs on all external doors of both safety and non-safety EGDGs rooms indicating that the doors should not be left open, discussing the event with site personnel; and initiation of changes to the site's cold weather checklist to check closed EGDG room doors during cold weather conditions.

The finding was more than minor since it affected the equipment availability attribute of the Mitigating System Cornerstone and resulted in an unavailable emergency diesel generator train for approximately 13 hours. The inspectors assessed the finding using the SDP and determined that the finding was of very low safety significance (Green) since it was not a design or qualification deficiency, did not result in a loss of a system safety function, did not result in an actual loss of safety function of a single train for greater than allowed by improved technical specifications (ITS), did not represent an actual loss of safety function of risk-significant, non-technical specification equipment, and did not screen as risk significant due to external events. The inspectors found that the cause of this finding was not reflective of current performance since the EGDG door lacked the proper signage since initial plant operation. Therefore, a cross-cutting aspect was not assigned.

Inspection Report# : [2009002](#) (pdf)

Significance: G Mar 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Take Timely and Effective Corrective Actions Resulted in a Repeat Failure of a Main Feedwater Isolation Valve due to Magnesium Rotor Oxidation/Corrosion

The inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion XVI, Corrective Actions, for failure to take timely and effective corrective actions to prevent a second failure of a main feedwater isolation valve (MFIV) due to corrosion of the valve actuator's magnesium rotor. Specifically, corrective actions associated with a similar failure of a MFIV in 2005 were not enhanced when additional information became available through NRC Information Notice (IN) 2006-026, Failure of Magnesium Rotors in Motor-Operator Valve Actuators. As a result, in December 2008, a MFIV failed to operate due to magnesium rotor degradation. Corrective actions for the failure of FWV-30 include: installation of a new motor; development and implementation of engineering changes to replace the station's motor-operated valve (MOV) magnesium rotor motors with aluminum rotor motors (when available); ensuring the engineering staff is trained on effective correction action plans; and revision of MOV maintenance procedures to include information obtained from IN 2006-026 prior to the next MOV inspections.

The finding was more than minor because it affected the equipment availability attribute of the Mitigating System cornerstone and resulted in a MFIV being inoperable for a period of time greater than allowed by ITS. Since the valve would not have performed its safety function for greater than the ITS' allowed outage time, a SDP Phase 2 analysis was required. Based upon the Phase 2 results, a regional senior reactor analyst performed a Phase 3 evaluation. The Phase 3 evaluation concluded that the finding was of very low safety significance (Green). A contributing cause of the finding is related to the cross-cutting area of Problem Identification and Resolution with an operating experience

component (P.2(b)). Specifically, the licensee did not implement and institutionalize, in a timely manner, IN 2006-26 in station procedures and training programs associated with magnesium rotor inspections.

Inspection Report# : [2009002](#) (*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

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