U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

North Anna 2 – Quarterly Plant Inspection Findings

4Q/2017 – Plant Inspection Findings

On this page:

Initiating Events

Significance: G May 09, 2017
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Inadequate Design Control of 2-RC-P-1C Piping Supports

A self-revealing Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified for the failure to correctly translate applicable regulatory requirements and the design basis into specifications, drawings, procedures, and instructions. Specifically, the licensee failed to include the pipe support (2-FPH-CH-416-11) in the scope of design change (DC) NA-13-01059, Unit 2 Reactor Coolant Pump Seal Replacement, which resulted in a large mean stress on the socket weld due to the 1.5-inch controlled bleed-off line piping not being properly aligned in the downstream pipe support, and therefore not allowing for the thermal growth of the reactor coolant system (RCS). As a result of the large mean stress, a crack initiated at a small defect (lack of fusion) in the toe of the socket weld and propagated through the weld due to normal cyclic vibration from the Unit 2 'C" reactor coolant pump (RCP). This finding was entered into the licensee's corrective action program as Condition Report (CR) 1043540.

The finding was more than minor because it was associated with the design control attribute of the Initiating Events and Barrier Integrity cornerstones and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radio-nuclide releases caused by accidents or events. Specifically, the inadequate design control of the piping support following Unit 2 RCP Seal Replacement resulted in an un-isolable through wall leak in the controlled bleed-off line piping and was identified as RCS pressure boundary leakage. The inspectors evaluated the finding in accordance with Manual Chapter 0609.04, "Initial Characterization of Findings," Table 2, dated October 7, 2016, and the inspectors screened the finding using Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination Process (SDP) for Findings at-Power," dated June 19, 2012. The finding screened out in the review of the Barrier Integrity cornerstone as the performance deficiency (PD) was not related to pressurized thermal shock; therefore, the finding will be addressed under the Initiating Events cornerstone. Since the

issue affected multiple cornerstones and because the licensee classified the leakage as RCS pressure boundary leakage, the NRC performed a detailed risk evaluation for the PD. The detailed risk evaluation was performed by a regional SRA in accordance with the NRC IMC 0609 Appendix A utilizing the NRC North Anna SPAR model. The PD was modelled as an increase in the small loss of coolant accident frequency given a failure of the RCP seal. The dominant sequence was a rupture in the controlled bleed off line leading to a small loss of coolant accident due to RCP seal failure with failure of containment sump recirculation leading to loss of core heat removal and core damage. The risk was mitigated by the RCP seal failure probability and the remaining mitigation. The detailed risk evaluation estimated that the PD resulted in an increase in core damage frequency of < 1.0 E-6/year, a GREEN finding of very low safety significance.

The finding had a cross-cutting aspect in the area of human performance, work management H.5, because the licensee failed to include the pipe support (2-FPH-CH-416-11) in the scope of the design change by engineering information bulletin (EIB) # N10-002 requirements.

Inspection Report# : 2017001 *(pdf)*

Mitigating Systems

Significance: G Jun 02, 2017
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Qualify MCCs in Cable Penetration areas in accordance with 10 CFR 50.49

The NRC identified a Green non-cited violation of 10 CFR 50.49(f) for failing to qualify structures, systems, and components (SSCs) (eight motor control centers) located in a radiation harsh environment in accordance with IEEE Std. 323-1974 Section 5, ?Principles of Qualification.? In response to this issue, the licensee performed an operability determination and determined that the motor control centers (MCCs) were operable based on the material similarity of the original SSCs and the new SSCs. This issue has been entered into the corrective action program as CR 1065894.

The performance deficiency was determined to be more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of the safety related AC Power System. Specifically, the failure to perform environmental qualification for SSCs subject to a harsh environment, during which they must perform a safety function adversely affected the reliability of that equipment when called upon. This finding was not assigned a cross-cutting aspect because the issue did not reflect current licensee performance.

Inspection Report# : 2017007 *(pdf)*

Significance: G Jun 02, 2017
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Qualify EGS Quick Disconnects in Accordance With IEEE Std. 323-1974

The NRC identified a Green non-cited violation of 10 CFR 50.49(e)(5) for failing to base the qualified life of structures, systems, and components (SSCs) (i.e. Nordel Orings) on the known limits of extrapolation in accordance with IEEE 323 Sections 6.5.3, ?Extrapolation,? and 6.5.4 ?Determination of Qualification.? In response, the licensee determined that the affected components remained operable because the age of the O-rings in question was within the original qualification. The licensee entered this into their corrective action program as CR 1065957.

The performance deficiency was determined to be more than minor because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the failure to properly determine the qualified life and replace the O-rings at the required time interval would adversely affect the reliability of that equipment when called upon to respond to initiating events and prevent undesirable consequences. This finding was not assigned a cross-cutting aspect because the issue did not reflect current licensee performance.

Inspection Report# : 2017007 *(pdf)*

Significance: NOPD Jun 02, 2017
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Obtain NRC Approval for Changes to Safety-Related Dike West of Unit 2 Turbine Building for Flood Mitigation Strategy

The team identified a Severity Level IV non-cited violation of 10 CFR 50.59(c)(2), ?Changes, Tests, and Experiments,? for the licensee?s failure to obtain a license amendment, as specified by Nuclear Energy Institute (NEI) 96-07 Section, 4.3.2, prior to implementing a change that increased the likelihood of a malfunction of a safety-related dike. This has been entered into the licensee corrective action program as condition

report 1065945.

The violation was dispositioned using the traditional enforcement process in accordance with the NRC Enforcement Policy, Subsection 2.2.2 Revised August 1, 2016, because the issue affected the NRC?s ability to perform its regulatory oversight function. The NRC Enforcement Policy, Section 6.1, ?Violation Examples for Reactor Operations,? Subsection 6.1.d.2 specified that violations of 10 CFR 50.59 which resulted in conditions that were evaluated by the Significance Determination Process (SDP) as being of very low safety significance represented a severity level IV violation. The regional senior

reactor analyst performed a screening analysis to determine the significance of the violation. Using very conservative failure frequencies for ductile iron pipe used in water systems, and a conservative initiating event frequency for an independent simultaneous rainfall capable of filling the dike, the finding was determined to be of very low safety significance. The inspector determined that the detailed risk evaluation confirmed that a severity level IV violation was appropriate. Crosscutting aspects are not assigned to traditional enforcement violations.

Inspection Report# : 2017007 *(pdf)*

Barrier Integrity
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 : February 01, 2018

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