UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

August 7, 2017

Mr. John Dent, Vice President-Nuclear
and CNO
Nebraska Public Power District
Cooper Nuclear Station
72676 648A Avenue
P.O. Box 98
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION – NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000298/2017010

Dear Mr. Dent:

On June 29, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution inspection and a follow-up inspection for multiple Severity Level IV violations at your Cooper Nuclear Station, and discussed the results of this inspection with Mr. J. Kalamaja, General Manager Plant Operations and then-acting Vice President and Chief Nuclear Officer, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspection team reviewed the station's corrective action program and the station's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations. Based on the samples reviewed, the team concluded that your staff's performance in each of these areas was adequate to support nuclear safety. However, the team identified some substantial challenges with the station's implementation of some parts of the corrective action program and its associated processes. These challenges were primarily in your management's oversight of the corrective action program, the station's screening processes to determine the significance of issues, and your staff's implementation of operability determination processes.

The team also evaluated the station's processes for use of industry and NRC operating experience information, and the effectiveness of the station's audits and self-assessments. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

The team reviewed the station's programs to establish and maintain a safety-conscious work environment, and interviewed station personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews, the team found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

Finally, the team performed a second inspection to follow up on three Severity Level IV violations received by Cooper during calendar year 2015. This reinspection followed the station's failure to meet the objectives of NRC Inspection Procedure 92723 during the first attempt to perform the inspection in June 2016, which was documented in inspection report 05000298/2016002. Based on additional analysis performed by the station following the first inspection attempt, the team determined that the station has now met the objectives. This inspection activity is now complete; details are documented in the enclosed report.

NRC inspectors documented four findings of very low safety significance (Green) in this report, all of which involved violations of NRC requirements. Additionally, NRC inspectors documented one Severity Level IV violation with no associated finding. The NRC is treating all five of these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest any of these violations or their significance, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement; and the NRC resident inspector at the Cooper Nuclear Station.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Cooper Nuclear Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Thomas R. Hipschman, Team Leader
Inspection Program and Assessment Team
Division of Reactor Safety

Docket No.: 50-298
License No: DPR-46

Enclosure:
Inspection Report 05000298/2017010
w/ Attachment: Supplemental Information

cc w/ encl: Electronic Distribution

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	50-298
License:	DPR-46
Report:	05000298/2017010
Licensee:	Nebraska Public Power District
Facility:	Cooper Nuclear Station
Location:	72676 648A Ave Brownville, NE
Dates:	June 12 through June 29, 2017
Inspectors:	E. Ruesch, J.D., Senior Reactor Inspector (Team Lead) H. Freeman, Senior Reactor Inspector G. Pick, Senior Reactor Inspector P. Voss, Senior Resident Inspector C. Young, Senior Project Engineer
Approved By:	Thomas R. Hipschman, Team Leader Inspection Program and Assessment Team Division of Reactor Safety

Enclosure

SUMMARY

IR 05000298/2017010; 06/12/2017 – 06/29/2017; COOPER NUCLEAR STATION; PROBLEM IDENTIFICATION AND RESOLUTION (BIENNIAL)

The inspection activities described in this report were performed between June 12, 2017 and June 29, 2017, by four inspectors from the NRC's Region IV office and the resident inspector at Cooper Nuclear Station. The report documents four findings of very low safety significance (Green), all of which involved violations of NRC requirements. Additionally, NRC inspectors documented in this report one Severity Level IV violation with no associated finding. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects Within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Assessment of Problem Identification and Resolution

Based on its inspection sample, the team concluded that the licensee maintained a corrective action program in which individuals generally identified issues at an appropriately low threshold. However, once entered into the corrective action program, the licensee had some substantial programmatic challenges with evaluating these issues appropriately and timely, commensurate with their safety significance. These challenges were primarily in station management's oversight of the corrective action program, the station's screening processes to determine the significance of issues, and timely implementation of operability determination processes. With the exception of some corrective actions to preclude repetition that lacked sustainability, the licensee's corrective actions were generally effective, addressing the causes and extents of condition of problems.

The licensee appropriately evaluated industry operating experience for relevance to the facility and entered applicable items in the corrective action program. The licensee incorporated industry and internal operating experience in its root cause and apparent cause evaluations. The licensee performed effective and self-critical nuclear oversight audits and self-assessments. The licensee maintained an effective process to ensure significant findings from these audits and self-assessments were addressed.

The licensee maintained a safety-conscious work environment in which personnel were willing to raise nuclear safety concerns without fear of retaliation.

Cornerstone: Mitigating Systems

Green. The team identified a non-cited violation of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to assign corrective actions to preclude repetition of a significant condition adverse to quality associated with the loss of the high pressure coolant injection system. Specifically, between July 28, 2016, and June 29, 2017, the licensee failed to assign or complete corrective actions to prevent recurrence to address the failure of a relay coil that resulted in a loss of safety function for the single train high pressure coolant injection system. Corrective actions to restore compliance included reevaluation of the corrective

actions assigned to the root cause of the condition and the creation of corrective actions to prevent recurrence for the condition. The licensee entered this deficiency into the corrective action program as Condition Report CR 17 03544.

The licensee's failure to assign corrective actions to preclude repetition of a significant condition adverse to quality, in violation of 10 CFR 50, Appendix B, Criterion XVI, was a performance deficiency. The performance deficiency was evaluated using Inspection Manual Chapter 0612, Appendix B, "Issue Screening," dated September 7, 2012, and was associated with the Mitigating Systems cornerstone. The team determined that the performance deficiency was more than minor, and therefore a finding, because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the licensee's failure to assign corrective actions to preclude repetition of a significant condition adverse to quality could reasonably result in the condition recurring and creating more safety-significant equipment failures. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it: was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant non-technical specification train. The finding had a cross-cutting aspect in the area of problem identification and resolution associated with resolution, because the licensee failed to ensure that the organization took effective corrective actions to address issues in a timely manner commensurate with their safety significance [P.3]. (Section 4OA2.5)

- Green. The team identified a Green non-cited violation of Technical Specification 5.4.1.a, for the licensee's multiple failures to immediately evaluate operability of degraded or nonconforming conditions. The team identified multiple examples of these operability determinations not being performed within one shift, as required by procedure. Further, aggregate data indicated routine noncompliance with procedural requirements to document operability "immediately" and "without delay." The licensee entered this violation into its corrective action program as Condition Report CR-CNS-2017-03937, and began evaluating actions to restore compliance.

  Multiple failures to perform immediate operability determinations timely as required by station procedures is a performance deficiency. This performance deficiency is more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Appendix A, dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it did not result in the loss of operability or functionality of any system or train. This finding has a consistent process cross-cutting aspect in the human performance cross-cutting area because operators failed to use a consistent, systematic approach to make decisions regarding operability using the organization's well-defined decision making process (H.13). (Section 4OA2.5)

- Green. The team identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, for the licensee's programmatic failure to promptly identify adverse trends and enter them into the corrective action program. Often, when adverse trends were identified, they were addressed using informal processes. This was particularly the case for safety culture-related trends such as adverse trends in organizational behaviors. The licensee entered this violation into its corrective action program as Condition Report CR-CNS-2017-03938, and took action to formalize identification processes for potential adverse trends.

  The programmatic failure to promptly identify adverse trends as required by station procedures was a performance deficiency. This performance deficiency is more than minor because if left uncorrected, it has the potential to become a more significant safety concern. Specifically, failure to arrest an adverse trend, particularly in organizational behaviors, could lead to increased likelihood of a worker-induced initiating event or a failure to effectively mitigate an accident. Using Inspection Manual Chapter 0609, Appendix A, dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it did not result in the loss of operability or functionality of any system or train. This finding has a trending cross-cutting aspect in the problem identification and resolution cross-cutting area because the organization failed to use available information in the aggregate to identify programmatic and common cause issues (P.4). (Section 4OA2.5)

- Green. The team identified a non-cited violation of 10 CFR 50.65(a)(1)/(a)(2), for the licensee's failure to perform an a(1) evaluation and establish a(1) goals when the No. 2 diesel generator a(2) preventive maintenance demonstration became invalid. Specifically, on April 28, 2017, the No. 2 diesel generator exceeded its performance criteria when it experienced a second maintenance rule functional failure, but the licensee failed to perform an associated a(1) evaluation. The licensee had failed to appropriately evaluate a February 4, 2017, failure associated with the No. 2 diesel generator jacket water heater failure in the Maintenance Rule Program and, as a result, the site failed to evaluate and monitor the equipment under 10 CFR 50.65(a)(1) as required. Corrective actions taken by the licensee to restore compliance included reevaluation of the February 4, 2017, functional failure and performance of an a(1) evaluation. The issue was entered into the licensee's corrective action program as Condition Report CR-17-03930.

  The licensee's failure to monitor the No. 2 diesel generator in accordance with the requirements of 10 CFR 50.65(a)(1), due to incorrectly evaluating one maintenance rule functional failure, in violation of 10 CFR 50.65(a)(1)/(a)(2), was a performance deficiency. The inspectors screened the performance deficiency using Inspection Manual Chapter 0612, Appendix B, "Issue Screening," dated September 7, 2012, and determined that the issue was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it: was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant nontechnical specification train. The finding had a cross-cutting aspect in the area of problem identification and resolution associated with evaluation, because the licensee failed to ensure that the organization thoroughly evaluated

the No. 2 diesel generator issues to ensure that resolutions addressed causes and extent of conditions commensurate with their safety significance [P.2]. (Section 4OA2.5)

Other Findings and Violations

- Severity Level IV. The team identified a violation of 10 CFR 21.21(a), for the licensee's failure to adopt appropriate procedures to evaluate deviations and failures to comply to identify those associated with substantial safety hazards. Specifically, Procedure EN-LI-108, "10 CFR 21 Evaluations and Reporting," Revision 5C0, was inadequate to ensure that the correct reportability call was made for a manufacturing flaw discovered in a relay that had resulted in a loss of safety function for the high pressure coolant injection system on April 25, 2016. In particular, the procedure (1) led the licensee to incorrectly conclude that a substantial safety hazard could not be created, (2) allowed a limited extent of condition in performing the substantial safety hazard evaluation such that similarly dedicated parts were not included in the scope, and (3) included incorrect guidance in Attachment 9.3. Corrective actions to restore compliance included re-evaluation of the defect under Part 21 requirements and a procedure adequacy review of the EN-LI-108-01 procedure. The licensee entered this issue into the corrective action program as Condition Reports CR-17-03936 and CR-17-04143.

  The failure to adopt appropriate procedures to evaluate deviations and failures to comply to identify those associated with substantial safety hazards, in violation of 10 CFR 21.21(a), was a performance deficiency. The NRC's reactor oversight process considers the safety significance of findings by evaluating their potential safety consequences. Using Inspection Manual Chapter 0612, Appendix B, "Issue Screening," dated September 7, 2012, the team determined that the performance deficiency was of minor safety significance under the reactor oversight process because it involved a failure to make a report; however the underlying equipment failure was previously evaluated as having very low safety significance. The traditional enforcement process separately considers the significance of willful violations, violations that impact the regulatory process, and violations that result in actual safety consequences. Traditional enforcement applied to this finding because it involved a violation that impacted the regulatory process. The team used the NRC Enforcement Policy, dated November 1, 2016, to determine the significance of the violation. The inspectors determined that the violation was similar to Examples 6.9.d.10 and 6.9.d.13 of the Enforcement Policy, because although the procedure resulted in an inadequate reportability review and the issue was not reported as a manufacturing flaw, the licensee had reported some aspects of the event under the requirements of 10 CFR 50.73. As a result, the team determined that the violation should be classified as a Severity Level IV violation. Cross-cutting aspects are not assigned to traditional enforcement violations. (Section 4OA2.5)

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution (71152)

The team based the following conclusions on a sample of corrective action documents that were open during the assessment period, which ranged from June 24, 2015, to the end of the on-site portion of this inspection on June 29, 2017.

.1 Assessment of the Corrective Action Program Effectiveness

a. Inspection Scope

The team reviewed approximately 220 Condition Reports (CRs), including associated root cause analyses and apparent cause evaluations, from approximately 16,000 that the licensee had initiated or closed between June 2015 and June 2017. The majority of these (over 15,000) were lower-level condition reports that did not require cause evaluations. The inspection sample focused on higher-significance condition reports for which the licensee evaluated and took actions to address the cause of the condition. In performing its review, the team evaluated whether the licensee had properly identified, characterized, and entered issues into the corrective action program, and whether the licensee had appropriately evaluated and resolved the issues in accordance with established programs, processes, and procedures. The team also reviewed these programs, processes, and procedures to determine if any issues existed that may impair their effectiveness.

The team reviewed a sample of performance metrics, system health reports, operability determinations, self-assessments, trending reports and metrics, and various other documents related to the licensee's corrective action program. The team evaluated the licensee's efforts in determining the scope of problems by reviewing selected logs, work orders, self-assessment results, audits, system health reports, action plans, and results from surveillance tests and preventive maintenance tasks. The team reviewed daily CRs and attended the licensee's performance improvement review group (PRG), PRG pre-screen, operations focus, and aggregate performance review (APRM) meetings. The team assessed the licensee's reporting threshold and prioritization efforts, to observe the corrective action program's interfaces with the operability assessment and work control processes. The team's review included an evaluation of whether the licensee considered the full extent of cause and extent of condition for problems, as well as a review of how the licensee assessed generic implications and previous occurrences of issues. The team assessed the timeliness and effectiveness of corrective actions, completed or planned, and looked for additional examples of problems similar to those the licensee had previously addressed. The team conducted interviews with plant personnel to identify other processes that may exist where problems may be identified and addressed outside the corrective action program.

The team reviewed corrective action documents that addressed past NRC-identified violations to evaluate whether corrective actions addressed the issues described in the inspection reports. The team reviewed a sample of corrective actions closed to other

corrective action documents to ensure that the ultimate corrective actions remained appropriate and timely.

The team considered risk insights from both the NRC's and Cooper's risk models to focus the sample selection and plant tours on risk-significant systems and components. The team focused a portion of its sample on the primary containment and high pressure coolant injection systems, which the team selected for a five-year in-depth review. The team conducted walk-downs of this system and other plant areas to assess whether licensee personnel identified problems at a low threshold and entered them into the corrective action program.

b. Assessments

During the inspection period, the licensee significantly revised its corrective action program to incorporate two major industry initiatives. Among other enhancements, these revisions incorporated three significant changes to the program. First, the term "adverse condition" was introduced and defined to clarify when conditions or issues are required to be formally handled through the quality-related corrective action program, or when they can be handled instead through less-rigorous non-quality processes. Second, apparent cause evaluations (ACEs) were eliminated as a defined product and replaced with "adverse condition assessments" (ACAs) which are procedurally more flexible. The new ACA process allows station leadership more latitude to determine the appropriate level of resources to dedicate to evaluating and correcting important, but not necessarily critical problems. Third, several management-level corrective action program (CAP) oversight bodies were combined into a single performance improvement review group (PRG), which now fulfills all the leadership oversight functions formerly performed by the condition review group and the management performance review board (MPRB). The team noted that collectively these efficiency enhancements could improve CAP performance by allowing evaluation and corrective action resources to be focused on the most important problems.

1. Effectiveness of Problem Identification

The team determined that most conditions that required generation of a condition report by Procedure 0-CNS-LI-102, "Corrective Action Process," had been appropriately entered into the corrective action program. During the 24-month inspection period, licensee staff generated and screened over 16,000 condition reports, roughly 600 per non-outage month. All personnel interviewed by the team understood the requirements for condition report initiation, and expressed a willingness to enter newly identified issues into the corrective action program at a very low threshold.

However, the team noted that the licensee did not always enter adverse conditions identified through "cognitive trending" processes into the corrective action program. The team observed several instances where apparent adverse trends were discussed at performance improvement review group meetings, but any follow-up actions were taken informally, and were often documented in non-CAP processes, if at all. Further, of the 13 conditions being tracked as adverse station trends, five had been identified, at least in part, by the NRC or another external organization. The team determined the licensee's programmatic failure to enter adverse conditions into

the corrective action program was a more-than-minor performance deficiency; it is further discussed in Section 4OA2.5.c of this report.

The team also noted that condition reports were not always initiated timely. Procedure 0-CNS-LI-102 requires, “CR initiation should be completed prior to the end of the work day in which the condition was recognized, “and, “CR initiation should not be excessively delayed while gathering all of the associated information.” On several occasions during the inspection, issues identified by the team were not entered into the corrective action program until several days to two weeks later. The licensee entered this issue into the corrective action program as Condition Report CR-CNS-17-03937. Although this issue should be corrected, it constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section 2 of the Enforcement Policy.

Overall, with the exception of organizational and programmatic trends, the team concluded that the licensee generally maintained a low threshold for the formal identification of problems and entry of those problems into the corrective action program for evaluation, though entry was sometimes delayed.

2. Effectiveness of Prioritization and Evaluation of Issues

The team identified multiple concerns with the licensee’s prioritization and evaluation processes, or its implementation of these processes. These concerns were primarily focused in the areas of the licensee’s condition report screening process, adverse/non-adverse determinations, immediate operability determination timeliness and documentation quality, and extent of condition reviews performed during cause evaluations. Each of these areas is briefly addressed below.

Condition Report Screening

The team noted that the licensee’s process for initial screening of condition reports for significance differs significantly from standard industry practices. Preliminary significance of condition reports is initially assigned by a single member of the corrective action and assessment (CA&A) group. Significance assigned by CA&A is then reviewed in a pre-screening meeting, which is procedurally required, but lacks the formalities associated with most other quality processes, before being screened by management at PRG.

The team noted that the CA&A “pre-screen” appeared to introduce a confirmation bias in the pre-screen meeting. Further, the pre-screen meeting has no quorum requirement and inconsistent membership. The station has no qualification requirement for participants in the pre-screen meeting, and some key groups are not always represented. Though departments at Cooper generally have department performance improvement coordinators (DPICs), who act as CAP subject-matter experts for their groups, these DPICs do not represent their departments at the CR pre-screen. Additionally, during the several pre-screen meetings observed by the team, meeting participants did not reference the CR screening procedure or appear to have a copy available.

At the beginning of the on-site inspection period, the team observed that the PRG also lacked formality. Similar to the observation above regarding “cognitive

trending," this lack of a rigorous process for ensuring PRG decisions were recorded and formally tracked appeared to contribute to some intended actions not being accomplished. Further, the team noted that an observed inconsistent quality of cause evaluations and adverse condition assessments was likely at least partially attributable to this lack of rigor in PRG review.

Adverse/Non-adverse Determinations

The team noted that for two categories of adverse conditions, as defined by Procedure 0-CNS-LI-102, the licensee was inconsistent in its classification, sometimes designating them non-adverse. The first category, related to the above-noted lack of rigor in documenting and completing follow-up actions from PRG decisions, was a failure to consistently identify safety-culture-related adverse trends as adverse conditions as required by Procedure 0-CNS-LI-102. When behavior-related adverse trends were identified through discussions at PRG, follow-up actions to confirm or refute a suspected trend, or to address a known trend, were often taken informally or through the use of a non-CAP administrative process.

The second category was failures of quality components or subcomponents of safety-related structures, systems, or components (SSCs) whose failure did not necessarily directly affect the safety function of the SSC. For example, the licensee has experienced multiple failures of rod-full-out lights, which are part of the digital rod position indication system as described in the Updated Safety Analysis Report (USAR). The licensee usually classified failures of these components as non-adverse, contrary to the requirements of Procedure 0-CNS-LI-102 (e.g., Condition Reports CR-CNS-2016-09041 and CR-CNS-2017-03481.) A similar incorrect classification was also the subject of a minor violation described in the discussion of an annual problem identification and resolution sample in NRC inspection report 2016001 (ADAMS Accession No. ML16119A441.) In that case, operators initially did not recognize indications of a leaking scram outlet valve to be a condition requiring CR initiation; and once a CR was eventually written, it was improperly classified as non-adverse.

Additionally, over the previous two years, the NRC has issued three non-cited violations related to operators' failure to recognize degraded or nonconforming conditions—on June 25, 2015, NCV 2015008-03 documented main steam isolation valve (MSIV) limit switch preconditioning; on June 30, 2016, NCV 2016002-01 documented failure of a ball valve in the traversing in-core probe system; and on September 30, 2016, NCV 2016003-02 documented operators defeating systems designed to mitigate internal flooding.

The team determined that the licensee's failure to recognize degraded or nonconforming conditions, and to document some types of conditions as adverse, as required by corrective action program procedures, was a performance deficiency. The performance deficiency is subsumed in NCV 2017010-03, documented in Section 4OA2.5.c of this report, and will not be separately dispositioned.

Immediate Operability Determinations

The team reviewed a number of condition reports that included or should have included immediate operability determinations to assess the quality, timeliness, and

prioritization of these determinations. The team identified a number of recent instances where these immediate operability determinations were untimely or otherwise not performed in accordance with procedure: The team determined that the failure to timely screen adverse equipment conditions for operability was a more-than-minor performance deficiency; it is further discussed in Section 4OA5.5.b of this report.

Extent of Condition Reviews

The team noted numerous opportunities for improvement in the licensee's implementation of extent of cause and extent of condition analyses as part of its cause evaluation (and now adverse condition analysis) processes. Multiple lower-level examples were discussed with licensee personnel during the inspection; two more significant examples follow.

In June 2016 the NRC implemented Inspection Procedure 92723 at Cooper in response to three Severity Level IV violations received during calendar year 2015. One of the goals of that inspection was to ensure the licensee had identified the extent of cause and extent of conditions of the three violations impacting the regulatory process. The inspector performing that inspection documented several inadequacies with the license's extent of condition and cause evaluations. These are documented in NRC inspection report 2016002 (ML16211A197). A reinspection performed as part of this problem identification and resolution inspection determined that the revised evaluations were adequate to satisfy the inspection objectives, though some gaps still existed. This is further discussed in Section 4OA5 below.

Following the failure of an Allen-Bradley rotary relay that caused loss of function of the high-pressure coolant injection (HPCI) system, the licensee performed a failure analysis under Condition Report CR-CNS-2016-02281. This analysis determined that the failure had been caused by a faulty solder joint that, because of an inadequate dedication plan, had not been detected by a vendor during component dedication. The licensee's extent of condition only examined other relays of the same lot; it did not look for other similar components that may have been dedicated using similarly inadequate dedication criteria. This evaluation is also the subject of NCV 2017010-05, documented in Section 4OA2.5.e of this report.

Other Observations Related to Prioritization and Evaluation of Adverse Conditions

On February 4, 2017, the No. 2 emergency diesel generator jacket water heater failed, after having been in service for 39 years with no preventive maintenance or replacement schedule. This failure resulted in the inability to maintain the system above 100 degrees Fahrenheit, as required by system design to support fast-start capability. This was the second functional failure of the diesel generator during the cycle, which exceeded maintenance rule performance criteria, but the licensee failed to perform required monitoring. This issue is further discussed as NCV 2017010-04 in Section 4OA2.5.d of this report.

Finally, the team identified three minor performance deficiencies associated with prioritization and evaluation, at least two of which were also violations of NRC requirements:

- Following catastrophic failure of the control room emergency filtration system (CREFS) fan bearing in October 2016 which resulted in inoperability of an important safety system, the licensee failed to quarantine the failed parts as required by Procedure 0-CNS-LI-118, Step 6.1.4. This resulted in the inability to perform failure modes and effects analysis as required by Procedure 7.0.1.7, Step 1.1. In its cause evaluation for the bearing failure, performed under Condition Report CR-CNS-2016-07426, the licensee failed to take actions to ensure that parts were quarantined in the future. The team determined this was a violation of Criterion V of 10 CFR 50, Appendix B, which was minor because it was an isolated noncompliance and the failure has not recurred. However, if a repeat failure were to occur by a similar failure mechanism, potentially indicating that the lack of failure analysis caused actions to preclude repetition to be ineffective, the NRC may reevaluate this performance deficiency.

- Also in Condition Report CR-CNS-2016-07426, the licensee noted that the CREFS fans were classified as criticality level II (Crit-II) for the purpose of scheduling preventive maintenance. The team noted that this was contrary to the guidance contained in system engineering Desktop Guide 98-03-02, Revision 5, which is used by engineering to determine component criticality, and which indicates that these components should be Crit-I. Further, the desktop guide itself, which is not controlled as a quality procedure, is inconsistent with Procedure 7.0.14, "Preventive Maintenance Program," which is quality-related. The team determined that this failure to appropriately classify component criticality as required by procedure was a violation of Criterion V of 10 CFR 50, Appendix B. This violation was minor because the maintenance schedule as implemented met the requirements for Crit-I components.

- In Condition Report CR-CNS-2017-00610, the licensee identified incorrect mounting bolts installed in an emergency diesel generator fuel injector. The documented basis for operability included several assumptions regarding the bolting material. Queries to the vendor revealed that assumptions made in the initial operability determination about the bolting material were incorrect. After engineers received more accurate design information, and better identified the type of bolts that likely were installed, they failed to initiate a new condition report to ensure operability was addressed using the most up-to-date information, as required by 0-CNS-LI-012, Revision 7, Step 8.1.1.1.

Although these three issues should be corrected, they constitute violations of minor significance that are not subject to enforcement action in accordance with Section 2 of the Enforcement Policy.

Overall, the team determined that the licensee's process for screening and prioritizing issues that had been entered into the corrective action program supported nuclear safety, though some improvements are warranted.

3. Effectiveness of Corrective Actions

In general, the corrective actions identified by the licensee to address adverse conditions were effective. However, the team noted some challenges in the

licensee's development and implementation of sustainable corrective actions for some significant conditions adverse to quality.

Station procedures require corrective actions to preclude repetition (CAPRs) to be developed during a root cause evaluation for all significant conditions adverse to quality. The development and implementation of these CAPRs is meant to fulfil quality assurance requirements of Criterion XVI of 10 CFR 50, Appendix B. The team noted a number of instances where CAPRs did not appear adequate to preclude repetition of the subject event:

- Under Condition Report CR-CNS-2016-08744, licensee staff performed a root cause evaluation to determine the causes of a December 7, 2016, misalignment of the control room emergency air filtration system (CREFS). The CAPRs developed under this evaluation focused on the actions of an individual control room operator, and did not address broader organizational and programmatic causes for the operator's inadvertent actions.

- Under Condition Report CR-CNS-2016-07426, licensee staff evaluated the failure of a catastrophic bearing failure of CREFS fan A on October 23, 2016. The CAPR developed in this root cause evaluation was to revise a maintenance plan to ensure proper reassembly following maintenance. However, the revisions lacked the specificity necessary to prevent the same incorrect component reassembly after future maintenance. ("Verify fan bearings engaged with shaft.") Further, there was no indication that the revised steps were tied to a CAPR, a requirement to prevent future changes.

- On April 25, 2016, the licensee initiated a root cause evaluation under Condition Report CR-CNS-2016-02281 to evaluate two 2016 high pressure coolant injection (HPCI) failures that were initially presumed to be related. Though the failures were later determined to have different causes, the licensee opted to evaluate both root causes in a single evaluation, with a separate cause determined for each failure. A CAPR was assigned for one of the two root causes, but not for the other. This example is further discussed as NCV 2017010-01 in Section 4OA2.5.a of this report.

Overall, the team concluded that the licensee generally identified and implemented effective corrective actions for the problems evaluated in the corrective action program, though additional focus on root-cause CAPRs may be warranted. Where procedurally required, the licensee generally assessed the effectiveness of the corrective actions appropriately and made adjustments as necessary.

.2 Assessment of the Use of Operating Experience

a. Inspection Scope

The team examined the licensee's program for reviewing industry operating experience, including reviewing the governing procedures. The team reviewed a sample of 10 industry operating experience communications and the associated site evaluations out of the 45 completed in 2017 to assess whether the licensee had appropriately assessed the communications for relevance to the facility. The team also reviewed assigned actions to determine whether they were appropriate.

b. Assessment

Overall, the team determined that the licensee appropriately evaluated industry operating experience for its relevance to the facility. Operating experience information was incorporated into plant procedures and processes as appropriate. The licensee was effective in implementing lessons learned through operating experience. They took full advantage of being part of the Entergy fleet, to give a thorough review of the operational experience from a variety of sources. The licensee's evaluations conservatively considered operating experience from a wide variety of sources and provided appropriate assessment. Licensee personnel ensured that significant issues were dealt with in a thorough and timely manner. This was also true for the Part 21 process that is within the licensee's operational experience program. The team further determined that the licensee appropriately reviewed industry operating experience when performing root cause analysis and apparent cause evaluations.

.3 Assessment of Self-Assessments and Audits

a. Inspection Scope

The team reviewed a sample of licensee self-assessments and audits to assess whether the licensee was regularly identifying performance trends and effectively addressing them. The team also reviewed audit reports to assess the effectiveness of assessments in specific areas. The specific self-assessment documents and audits reviewed are listed in Attachment 1.

b. Assessment

Overall, the team concluded that the licensee had an effective self-assessment and audit process. The team determined that self-assessments were self-critical and thorough enough to identify deficiencies.

.4 Assessment of Safety-Conscious Work Environment

a. Inspection Scope

The team interviewed 51 licensee personnel—45 in five focus groups and six individually—(1) to evaluate the willingness of licensee staff to raise nuclear safety issues, either by initiating a condition report or by another method, (2) to evaluate the perceived effectiveness of the corrective action program at resolving identified problems, and (3) to evaluate the licensee's safety-conscious work environment. The focus group participants included personnel from operations, training, engineering, planning and scheduling, electrical, mechanical, instrumentation, and control. At the team's request, the licensee's regulatory affairs staff selected the participants blindly from these work groups, based partially on availability. To supplement these focus group discussions, the team interviewed the employee concerns program manager to assess her perception of the site employees' willingness to raise nuclear safety concerns. The team reviewed the employee concerns program case log and select case files.

b. Assessment

1. Willingness to Raise Nuclear Safety Issues

All individuals interviewed indicated that they would raise nuclear safety concerns by one or more of the methods available. All felt that their management was receptive to raising nuclear safety concerns and encouraged them to do so. All of the interviewees agreed that if they were not satisfied with the response from their immediate supervisor, they had the ability to write a condition report or to escalate the concern to a higher organizational level. All individuals indicated that they were aware of changes that had been implemented earlier in the year associated with the submittal of condition reports anonymously [anonymous concerns are now screened by the Employee Concerns Program who either addresses the concern or directs it to the appropriate venue]. All individuals felt that this was appropriate because most of the anonymous condition reports had become a forum or submitting personal character attacks that should not be viewed by the general workforce.

2. Employee Concerns Program

All interviewees were aware of the employee concerns program. Most explained that they had heard about the program through various means, such as posters, training, presentations, and discussion by supervisors or management at meetings. Most interviewees stated that they would use the employee concerns program if they felt it was necessary.

3. Preventing or Mitigating Perceptions of Retaliation

When asked if there have been any instances where individuals experienced retaliation or other negative reaction for raising issues, all individuals interviewed stated that they had neither experienced nor heard of an instance of retaliation, harassment, intimidation, or discrimination at the site. The team determined that processes in place to mitigate these issues were being successfully implemented. Responses from the focus group interviewees indicate that they believe that management has established and promoted a safety-conscious work environment where individuals feel free to raise safety concerns without fear of retaliation. Overall, employees indicated that there has been a steady improvement of the culture on-site.

.5 Findings

a. Failure to Assign Corrective Actions to Prevent Recurrence of High Pressure Coolant Injection Failure

Introduction. The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to assign corrective actions to preclude repetition (CAPRs) of a significant condition adverse to quality (SCAQ) associated with the loss of the high pressure coolant injection (HPCI) system. Specifically, between July 28, 2016, and June 29, 2017 the licensee failed to assign or complete CAPRs to address the failure of a relay coil that resulted in a loss of safety function for the single train HPCI system.

Description. On April 25, 2016, a licensed operator performing a control room panel walkdown noted that the green light for the HPCI auxiliary lube oil pump (ALOP) was not illuminated. Operations personnel attempted to start the ALOP and it failed to start. Due to the inoperability of the ALOP, the licensee declared the HPCI system inoperable and entered the associated technical specifications (TSs). The licensee reported the event as a loss of safety function under the requirements of 10 CFR 50.72 and 50.73 (Licensee Event Report 2016-001).

The licensee initiated a root cause evaluation (RCE) under Condition Report CR-17-02281 to determine the cause of the condition. Investigation revealed that an Allen-Bradley 700DC relay for the ALOP that had been installed during a maintenance window 6 days earlier had failed due to infant mortality. Specifically, the relay coil internal to the relay had failed after approximately 133 hours of service. The failure was attributed to the overheating of the coil windings, caused by a manufacturing defect. The licensee's root cause evaluation found that the commercial grade dedication process used by the Nutherm vendor did not have sufficient checks to identify the infant mortality failure of the relay.

On June 29, 2017, during review of the RCE, the inspectors found that the licensee had not issued any corrective actions to prevent recurrence or preclude repetition (CAPRs) of the significant condition adverse to quality (SCAQ) associated with the relay failure and the inadequate Nutherm dedication process. Instead, the root cause corrective action (CA) plan stated, in part (with some portions crossed out), "The newly revised dedication process used by Nutherm takes care of the issues related to this specific RC1. This is why there is no CAPR. CA-A2 is an "insurance" action." The corrective action this statement referred to directed that "a review of all current dedication pre-installation checks shall be conducted to determine what is necessary to reasonably ensure that infant mortality failures of the HPCI ALOP control relay are minimized. The review shall include the recently revised dedication process, dated May 13, 2016, used by Nutherm and the findings by Exelon in their analysis of the relay failure." The inspectors did not identify any definitions for "insurance actions" in the licensee's corrective action program procedures.

Upon the inspectors' review of this corrective action, they discovered that it did not have any completion documentation to demonstrate that the action was, in fact, completed. Instead, the action was listed directly in the RCE as being completed on May 25, 2016, (before the RCE was even complete.) The inspectors noted that the action could not have been fully completed at that time, because the final Exelon Labs report was not received and reviewed by the station until July 29, 2016. In addition, the inspectors reviewed the changes made to the dedication plan for the relay that appeared to be completed in response to this corrective action. The inspectors noted that although the dedication plan was changed to include cycling the relays 30 times, measuring resistance across the relay coils, and testing for dielectric strength of the relays, there appeared to be no actions in place in the dedication plan or in the station's procedure to ensure that the changes would remain in place. As a result, the inspectors concluded that there were no actions in place to ensure the corrective action was sustainable and would preclude repetition of the SCAQ.

The inspectors reviewed the corrective action program (CAP) procedures that were in effect at the time of the inspection. Procedure 0-CNS-LI-118, "Cause Evaluation

Process," Revision 0, Section 3.5 states in part, "At least one CAPR is required for a SCAQ."

The inspectors also reviewed the CAP procedures that were in place at the time of performance of the RCE. Procedure 0-CNS-LI-102, Revision 3, Step 10.2.2 states in part, the "Responsible Manager must (1) ensure a Root Cause Evaluation is performed for Category "A" CRs and that appropriate CAPRs are issued, and (2) ensure formulation of a proposed CA Plan to correct the condition and to preclude repetition." This procedure also requires that, "The Corrective Action Plan includes an action to perform an Effectiveness Review of the CAPRs." The inspectors concluded that the licensee's responsible manager had not ensured any appropriate CAPRs were issued for the Category "A" CR associated with a loss of the HPCI system due to a relay failure. The inspectors noted that assigning a CAPR would have required performance of an effectiveness review which would have provided programmatic oversight over whether or not the CAPRs were succeeding in preventing recurrence. Section 11.1.4 of this procedure stated, in part, "For CAPRs that are credited as being implemented by revising training documents or procedure actions or requirements, the applicable steps in the associated procedure should be annotated or flagged as obligations in accordance with applicable site procedures." The inspectors noted that the changes made to the dedication process requirements for these relays were not annotated or flagged, to ensure they would remain in place.

The inspectors reviewed licensee Procedure EN-LI-118, "Cause Evaluation Process," Revision 22, which was also in place at the time the RCE was performed. Section 4.(g) of this procedure states, "the Cause Evaluator is responsible for developing a corrective action plan that will resolve the condition, the cause(s), and any other issues identified in the cause evaluation requiring correction. For root causes, develop corrective actions to preclude repetition (CAPR)." The inspectors noted that for the root cause associated with the failure of the HPCI relay, the cause evaluator did not develop CAPRs as required by the procedure. Section 5.12.11 states, "RCEs for Adverse Conditions require a Corrective Action to Preclude Repetition (CAPR). CAPRs should:

(a) Eliminate the causes of the significant event so that the same or similar events are not repeated, or

(b) Mitigate the consequences of a repeat event, or

(c) Significantly reduce the probability of occurrence of similar events of lower significance.

(d) Clearly result in long-term correction and are sustainable."

Section 5.13.1.1 also states, "Effectiveness Review Plans are required for CAPRs." The inspectors concluded that the RCE had not established any CAPRs that met these requirements and had not established necessary effectiveness review to ensure that assigned CAs were performing long sustainable correction of the SCAQ.

During the inspectors' review of the RCE associated with this event, they identified several weaknesses and deficiencies associated with the evaluation, in addition to the lack of an assigned CAPR for the relay-related SCAQ. In particular, the inspectors noted that many of the issues they identified during their review of this revision of the

RCE had been identified by the inspectors previously and documented in Condition Report CR-16-04137. The inspectors noted that the licensee had attempted to address these weaknesses in response to the CR, but these actions had fallen short of their intended goal. The RCE weaknesses that the inspectors identified included: incorrect information regarding local operation of HPCI contained in the RCE resulted in the conclusion that the event only had medium risk (Condition Report CR-17-03570); the extent of cause did not consider whether the cause of the light bulb event had extended to other modifications performed by the site (Condition Report CR-17-3917); the extent of cause did not review whether the relay dedication issues associated with the relay failure were specific to the Nutherm vendor or if they were a more generic procurement and dedication issue (Condition Report CR-17-03915); the corrective action related to establishing improved relay testing methods had inadequate closure documentation (Condition Report CR-17-03920); and the Part 21 reportability evaluation was inadequate (addressed as a separate NCV in this report.) These issues were entered into the licensee's corrective action program for further evaluation.

Analysis. The licensee's failure to assign corrective actions to preclude repetition of a significant condition adverse to quality, in violation of 10 CFR 50, Appendix B, Criterion XVI, was a performance deficiency. The performance deficiency was evaluated using Inspection Manual Chapter 0612, Appendix B, "Issue Screening," dated September 7, 2012, and was associated with the Mitigating Systems cornerstone. The team determined that the performance deficiency was more than minor, and therefore a finding, because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the licensee's failure to assign corrective actions to preclude repetition of an SCAQ could reasonably result in the condition recurring and creating more safety-significant equipment failures. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it: was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant non-technical specification train. The finding had a cross-cutting aspect in the area of problem identification and resolution associated with resolution, because the licensee failed to ensure that the organization took effective corrective actions to address issues in a timely manner commensurate with their safety significance [P.3].

Enforcement. 10 CFR 50, Appendix B, Criterion XVI requires, in part, that "measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition." Contrary to the above, between July 28, 2016, and June 29, 2017, in the case of a significant condition adverse to quality associated with HPCI, the measures did not assure that the cause of the condition was determined and corrective action taken to preclude repetition. Specifically, the licensee failed to assign or complete corrective actions to prevent recurrence (CAPRs) to address a significant condition adverse to quality associated with the failure of a relay coil that resulted in a loss of safety function of the HPCI system. Corrective actions to restore compliance included reevaluation of the corrective actions

assigned to the root cause of the condition and the creation of corrective actions to prevent recurrence for the condition. Because this violation was of very low safety significance (Green) and was entered into the licensee's corrective action program as Condition Report CR-17-03544, this violation is being treated as a non-cited violation (NCV) in accordance with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000298/2017002 01, "Failure to Assign Corrective Actions to Prevent Recurrence of High Pressure Coolant Injection Failure."

b. Failure to Perform Timely Operability Determinations

Introduction. The team identified a Green non-cited violation of Technical Specification 5.4.1.a for the licensee's multiple failures to immediately evaluate operability of degraded or nonconforming conditions. The team identified multiple examples of these operability determinations not being performed within one shift, as required by procedure. Further, aggregate data indicated routine noncompliance with procedural requirements to document operability "immediately" and "without delay."

Description. Licensee Procedure 0.5.OPS, "Operations Review of Condition Reports/Operability Determination," Revisions 56 and 57, define immediate determination as, "The Operability Determination performed immediately after confirmation that a Degraded or Non-Conforming Condition exists for a [structure, system, or component] required to be operable by Technical Specifications." It further states, "Operability should be determined immediately upon discovery…without delay…using the best information available." A separate process is provided to gather initial information to support the immediate determination: "Prompt Determination is a follow-up and is warranted when additional information is needed to confirm the immediate determination."

The team reviewed a population of 543 immediate operability determinations performed on degraded or nonconforming conditions between January 1, 2017, and June 13, 2017. Of this population, approximately 35 (6.5 percent) took greater than 12 hours, meaning they could not have been accomplished within one shift as required by procedure. A number of others that were accomplished within 12 hours likely also exceeded the one-shift requirement, but the team did not review actual times of documentation as compared to shift-change times to determine an accurate count. The median time from CR initiation to operability declaration was over 4 hours, with nearly a third (31 percent) taking greater than 6 hours.

The team reviewed several examples where substantial time had elapsed between identification of the degraded or nonconforming condition and the documentation of operability. Two examples follow:

- On February 7, 2017, during emergency diesel generator (EDG) maintenance, personnel discovered incorrect bolting installed in the injector and documented the condition in Condition Report CR-CNS-2017-00610. The EDG was returned to service at 0817 on February 9, 2017. A final operability declaration was not made by the shift manager until 1843 that evening, over 2 days after discovery and over 10 hours after the equipment was returned to service.

- On June 12, 2017, the licensee initiated Condition Report CR-CNS-2017-03505, documenting receipt of NRC Part 21 report 2017-31-00, which described a

potential defect in Curtiss-Wright Grayboot socket contacts. The condition report was generated at 0952 on June 12 with an operability assignment to operations. After four revisions to the immediate determination documentation between 2336 on June 12 and 0311 on June 13 an operability declaration was made by the shift manager at 0320, almost 18 hours after the condition was formally identified.

These extended time periods appeared to be primarily due to efforts by operations or engineering to confirm operability, an activity which should procedurally be performed under the prompt determination process after operations has made an immediate declaration "immediately…using the best information available."

Analysis. Multiple failures to perform immediate operability determinations timely as required by station procedures is a performance deficiency. This performance deficiency is more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Appendix A, dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it did not result in the loss of operability or functionality of any system or train. This finding has a consistent process cross-cutting aspect in the human performance cross-cutting area because operators failed to use a consistent, systematic approach to make decisions regarding operability using the organization's well-defined decision making process (H.13).

Enforcement. Cooper Nuclear Plant Technical Specification 5.4.1.a requires that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Contrary to this requirement, between January 1, 2017, and June 13, 2017, the licensee failed to establish, implement, and maintain written procedures recommended in Regulatory Guide 1.33. Specifically, the list in Appendix A of the Regulatory Guide includes procedures governing authorities and responsibilities for safe operation and shutdown. One of the procedures used by NPPD to meet this requirement is 0.5.OPS. The licensee failed to implement the procedure as written. The licensee entered this violation into its corrective action program as Condition Report CR-CNS-2017-03937, and began evaluating actions to restore compliance. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program, the violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000298/2017010-02, "Failure to Perform Timely Operability Determinations."

c. Programmatic Failure to Identify and Correct Adverse Trends

Introduction. The team identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI for the licensee's programmatic failure to promptly identify adverse trends and enter them into the corrective action program. Often, when adverse trends were identified, they were addressed using informal processes. This was particularly the case for safety-culture-related trends such as adverse trends in organizational behaviors.

Description. The licensee's corrective action program is governed by Procedure 0-CNS-LI-102, which describes the roles and responsibilities of various site personnel in implementing aspects of the program. Leadership oversight of the

corrective action program is provided by the performance improvement review group (PRG), which consists of senior site management from all major departments. The PRG meets three times each week to review products generated by the corrective action program, including condition report, cause evaluations, effectiveness reviews, and other documents. The team observed several of these meetings and noted that on a number of occasions multiple issues were discussed in the aggregate, but no actions were taken to determine whether that aggregation represented an early indication of a declining trend. Further, when actions were taken to evaluate trends, they were often tracked as "LO" or "WT" actions, which are not governed by the quality processes of the corrective action program.

The team also noted several specific adverse trends that were not promptly identified by the licensee:

- During the first several months of operation following the past five or more outages, the station has experienced failures of the rod-full-out lights in the digital rod position indication system. Each time, the licensee had documented the failure, but had failed to take action to review the failures in the aggregate or to fix the underlying cause. The licensee documented this issue in Condition Report CR-CNS-2017-04571.

- The licensee periodically conducts an Aggregate Performance Review Meeting, where managers review station performance and ongoing improvement efforts. This meeting includes a review of adverse trend CRs with actions currently in progress to correct the trend. At the June 2017 meeting, of the 13 adverse trends being tracked, 5 (38 percent) were identified at least in part by the NRC.

- On May 22, 2017, the licensee declared the traversing in-core probe (TIP) C ball valve inoperable as a primary containment isolation valve (PCIV) due to the failure of the in-shield limit switch. Although the TIP ball valves have experienced multiple failures for the same or similar causes dating back to 2006, including seven TIP ball valve limit switch-related failures since February 2016, no trend CR was generated by the licensee until approximately one month later when the NRC inspection team was onsite.

- In January 2017 the resident inspectors identified that over the course of 2016, there had been over 30 instances where the control room experienced the momentary loss of annunciator chassis that supply power to the control room panel annunciators. Although in each case the control room only lost one chassis at a time and annunciator functionality was maintained, the licensee was required to enter Abnormal Procedure 2.4ANN, "Annunciator Abnormal," during each occurrence and to perform the required actions. In most cases, the licensee did not know what caused the temporary failure. The inspectors challenged the licensee on whether these events represented an adverse trend, and after several discussions with station personnel, the licensee initiated Condition Report CR-17-00373 to evaluate the trend.

Analysis. The programmatic failure to promptly identify adverse trends as required by station procedures was a performance deficiency. This performance deficiency is more than minor because if left uncorrected, it has the potential to become a more significant

safety concern. Specifically, failure to arrest an adverse trend, particularly in organizational behaviors, could lead to increased likelihood of a worker-induced initiating event or a failure to effectively mitigate an accident. Using Inspection Manual Chapter 0609, Appendix A, dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it did not result in the loss of operability or functionality of any system or train. This finding has a trending cross-cutting aspect in the problem identification and resolution cross-cutting area because the organization failed to use available information in the aggregate to identify programmatic and common cause issues (P.4).

Enforcement. Title 10 CFR 50, Appendix B, Criterion XVI requires that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, for an indeterminate period of time prior to June 29, 2017, the licensee failed to establish measures to assure that conditions adverse to quality are promptly identified and corrected. Specifically, measures established by station corrective action program procedures were not effective in promptly identifying and correcting adverse trends in equipment and organizational performance. The licensee entered this violation into its corrective action program as Condition Report CR-CNS-2017-03938, and took action to formalize identification processes for potential adverse trends. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program, the violation is being treated as non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000298/2017010-03, "Programmatic Failure to Identify and Correct Adverse Trends."

d. Failure to Monitor No. 2 Diesel Generator Under 50.65(a)(1) due to Inadequate Maintenance Rule Evaluation

Introduction. The team identified a Green, non-cited violation of 10 CFR 50.65(a)(1)/(a)(2), for the licensee's failure to perform an a(1) evaluation and establish a(1) goals when the No. 2 diesel generator (DG) a(2) preventive maintenance demonstration became invalid. Specifically, on April 28, 2017, the No. 2 DG exceeded its performance criteria when it experienced a second maintenance rule functional failure (MRFF), but the licensee failed to perform an associated a(1) evaluation. The licensee had failed to appropriately evaluate a February 4, 2017, failure associated with the No. 2 DG jacket water heater failure in the maintenance rule program and, as a result, the site failed to evaluate and monitor the equipment under 10 CFR 50.65(a)(1) as required.

Description. On June 21 during a review of the licensee's Maintenance Rule Program functional failure evaluations and corrective action reports, the inspectors noted that one component failure did not appear to be correctly evaluated in the licensee's Maintenance Rule Program as a MRFF. Specifically, the inspectors identified that on February 4, 2017, a failure of the No. 2 diesel generator jacket water heater resulted in the need to take the DG out of service due to the fact that jacket water temperatures were quickly approaching the minimum required operability limit of 100 degrees F (Condition Report CR-17-00551). Although the condition resulted in the need to declare the DG inoperable, the licensee had determined that this issue was not a MRFF. The inspectors reviewed the event to assess the appropriateness of the licensee's evaluation.

At 2038 on February 4, 2017, the licensee received alarms in the control room which indicated that there was a ground on the No. 2 DG motor control center transformer. The licensee discovered that the jacket water heater had failed, and as a result, the licensee was required to secure power to the heater and jacket water temperature began to lower. Operations personnel initiated actions to monitor the temperature trends to ensure that action was taken prior to the lower temperature limit being exceeded. At the time of discovery, temperatures were indicating 131 degrees F on the inlet to the heater and 136 degrees F on the outlet of the heater. By approximately 0443 on February 5, 2017, temperatures had dropped to 102 degrees F on the inlet to the heater and 118 degrees F on the outlet of the heater. At that time, the licensee declared No. 2 DG inoperable.

When the licensee initiated repairs on the heater, they learned that the heater elements had overheated and melted open in several locations. The licensee performed a "C – Fix" level evaluation for the heater failure. This evaluation revealed that the heater had been in place since the beginning of plant life and was installed in 1974. The evaluation also revealed that there was no preventive maintenance (PM) activity in place that would drive replacement of the heater. Instead, the licensee was performing 5-year cleaning and inspection PMs. As a result, the licensee created a PM activity to drive replacement of the heater on a 16-year frequency.

The inspectors reviewed the MRFF determination documentation and discussed the conclusions with systems engineering personnel. The inspectors learned that the licensee had not counted the failure as an MRFF because they had concluded that there was no lower limit on temperature for the jacket water system. The licensee had relied on a letter, dated March 26, 1998, which was received from MPR Associates, Inc., who had taken on vendor responsibilities for the Cooper-Bessemer DGs in operation at the station. Licensee personnel pointed to a statement in this letter that said, "No 'design' lower temperature limit for C-B Model KSV Diesel Engine Jacket Water System." As a result, the licensee had determined that this equipment failure did not constitute an MRFF.

The inspectors challenged the licensee on this assessment. In particular, Station Operating Procedure 2.2.20, "Standby AC Power System (Diesel Generator)," Revision 95, Section 2.2 (Precautions and Limitations) stated, "If jacket water or lube oil temperature is less than or equal to 100 degrees F while DG is in standby, DG shall be declared inoperable." In addition, Section 1.2.4 explained that the procedure contained minimum required temperature limitations for jacket water and lube oil in order to meet the diesel generator fast start requirements. In addition, the inspectors noted that the Maintenance Rule Basis Document for the DG system function included specific provisions for jacket water temperatures. Specifically, the Function Description section stated, "The Jacket Water (DGJW) sub-systems consist of a standpipe, connecting pipes, pumps, temperature control valves, coolers, standby heaters, valves, and instrumentation necessary to remove heat from the engine jackets during operations or provide heat during standby conditions to maintain the engine jackets greater than or equal to 100 degrees F for fast-starting capability."

Finally, the inspectors reviewed the MPR letter that the licensee had used as the basis for the decision not to classify the failure as a MRFF. The inspectors discovered that the statement the licensee relied on for their determination that there were no low temperature limits for the DG was applicable only for performing "non-timed starts from

maintenance conditions." The inspectors noted that the line below it included different guidance with respect to "low temperature limits for normal EDG fast starts." For fast starts, the low limit for the jacket water was listed as 100 degrees F. In response to inspector questions on the basis for the 100 degree F limit throughout station procedures, the licensee discovered that historical procedure change requests had also referenced the "fast start" limitations derived from the same MPR letter. As a result, the licensee agreed that there was a lower temperature limit for DG jacket water. The inspectors concluded that the heater failure represented a MRFF because:

1. The heating function of the heater was directly described as part of the DG function in the Basis Document and failure of the component represented a functional failure; and

2. Due to the equipment failure, the licensee was required to take the DG out of service and declare it inoperable when jacket water temperatures reached the lower temperature limit.

The inspectors reviewed the Maintenance Rule performance criteria for the No. 2 DG. The inspectors determined that the No. 2 DG was allowed one MRFF in a 24 month cycle. The inspectors noted that the No. 2 DG already had one MRFF counted against it due to a relay failure that resulted in the DG being declared inoperable on April 28, 2017, (Condition Report CR-17-02533). With the additional failure associated with the jacket water heater, the inspectors concluded that the No. 2 DG had exceeded its performance criteria on April 28, 2017, and invalidated its (a)(2) preventive maintenance demonstration. As a result, the inspectors concluded that the licensee had failed to take the necessary actions required by (a)(2)/(a)(1).

Analysis. The licensee's failure to monitor the No. 2 DG in accordance with the requirements of 10 CFR 50.65(a)(1) due to incorrectly evaluating one MRFF, in violation of 10 CFR 50.65(a)(1)/(a)(2), was a performance deficiency. The inspectors screened the performance deficiency using Inspection Manual Chapter 0612, Appendix B, "Issue Screening," dated September 7, 2012, and determined that the issue was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it: was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant nontechnical specification train. The finding had a cross-cutting aspect in the area of problem identification and resolution associated with evaluation, because the licensee failed to ensure that the organization thoroughly evaluated the No. 2 diesel generator issues to ensure that resolutions addressed causes and extent of conditions commensurate with their safety significance [P.2].

Enforcement. Title 10 CFR 50.65 (a)(1), requires in part, that holders of an operating license shall monitor the performance or condition of SSCs within the scope of the rule as defined by 10 CFR 50.65 (b), against licensee established goals, in a manner

sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions. Title 10 CFR 50.65 (a)(2) states, in part, that monitoring, as specified in 10 CFR 50.65 (a)(1), is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function. Contrary to the above, on April 28, 2017, the licensee failed to demonstrate that the performance or condition of the No. 2 DG was being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remained capable of performing its intended function, and failed to monitor the performance or condition of the SSC against licensee-established a(1) goals. Specifically, the No. 2 DG exceeded its performance criteria when it experienced a second MRFF, but the licensee failed to perform an associated a(1) evaluation because engineering personnel had not correctly evaluated a February 4, 2017, failure associated with the No. 2 DG jacket water heater in the Maintenance Rule Program. As a result, the site failed to evaluate and monitor the equipment under 10 CFR 50.65(a)(1) as required. Corrective actions taken by the licensee to restore compliance included reevaluation of the February 4, 2017, functional failure and performance of an a(1) evaluation. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program (Condition Report CR-17-03930), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000298/2017010-04, "Failure to Monitor No. 2 Diesel Generator under 50.65(a)(1) due to Inadequate Maintenance Rule Evaluation."

e. Failure to adopt appropriate procedures in accordance with 10 CFR Part 21

Introduction. The team identified a Severity Level (SL) IV violation of 10 CFR 21.21(a) for the licensee's failure to adopt appropriate procedures to evaluate deviations and failures to comply to identify those associated with substantial safety hazards. Specifically, Procedure EN-LI-108, "10 CFR 21 Evaluations and Reporting," Revision 5C0, was inadequate to ensure that the correct reportability call was made for a manufacturing flaw discovered in a relay that had resulted in a loss of safety function for the high pressure coolant injection (HPCI) system on April 25, 2016.

Description. On April 25, 2016, a licensed operator performing a control room panel walkdown noted that the green light for the HPCI auxiliary lube oil pump (ALOP) was not illuminated. Operations personnel attempted to start the ALOP, and it failed to start. Due to the inoperability of the ALOP, the licensee declared HPCI inoperable and entered Technical Specification Limiting Condition for Operation (LCO) 3.5.1, Condition C. Condition C required verification by administrative means that the reactor core isolation cooling (RCIC) system was operable within 1 hour; and restoration of the HPCI system to operable status within 14 days. The licensee also reported the event as a loss of safety function under the requirements of 10 CFR 50.72 and 50.73 (Licensee Event Report 2016-001).

The licensee initiated a root cause evaluation (RCE) under Condition Report CR-17-02281 to determine the cause of the condition. Investigation revealed that an Allen-Bradley 700DC relay for the ALOP that had been installed during a maintenance window 6 days earlier had failed due to infant mortality. Specifically, the relay coil internal to the relay had failed after approximately 133 hours of service. The failure was attributed to the overheating of the coil windings, caused by a manufacturing

defect. The licensee's root cause evaluation found that the commercial grade dedication process used by the Nutherm vendor did not have sufficient checks to identify the infant mortality failure of the relay. Specifically, the dedication plan lacked testing described in C37.90-1989, "ANSI/IEEE Standard for Relays and Relay Systems Associated with Electric Power Apparatus," including testing of the dielectric strength of the relay coil and testing for relay coil resistance. The RCE determined that these checks would likely have prevented the relay failure that resulted in the loss of the HPCI system.

On June 21, 2017, the inspectors reviewed the RCE and questioned why the defect had not been reported under the requirements of 10 CFR Part 21. The licensee initially explained that the issue had not been determined to be a manufacturing flaw. In response, the inspectors pointed out that the RCE and the lab failure analysis had both determined that the relay failure was the result of a manufacturing defect. The licensee then provided the inspectors with the documented Part 21 reportability evaluation. This evaluation stated, "This condition is not reportable per 10 CFR 21." The failure of HPCI by itself is not a substantial safety hazard. Alternate depressurization system (ADS) and low pressure emergency core cooling system (ECCS) were unaffected by the relay issue and were still available for accident mitigation and decay heat removal."

The inspectors reviewed 10 CFR Part 21 requirements and NUREG 0302, "Reporting and Defects and Noncompliance." As a result of their review, and in consultation with NRC headquarters staff, the inspectors determined that the loss of HPCI should be categorized as a potential substantial safety hazard (SSH). Specifically, in the category of a "major degradation" which could create an SSH, NUREG 0302 states, "the loss of safety function of a basic component is considered a major reduction in the degree of protection provided to the public health and safety." The inspectors noted that HPCI is a single train system for accident conditions, and as a result, loss of the system created a loss of a safety function, as described by 10 CFR 50.72 and 10 CFR 50.73 requirements. The inspectors concluded that the ADS referenced in the licensee's evaluation did not perform the same safety function. Specifically, ADS allows operations personnel to reduce pressure in the reactor in order to initiate another mitigating system. The ADS function does not allow for operators to add high pressure inventory to the vessel; rather, it relies on the availability of the low pressure injection systems, which serve a separate safety function.

In addition, the inspectors noted that the SSH review should have included in its scope, other places where the defect potentially could exist. The inspectors and licensee agreed that both the relay equipment failure and the inadequate dedication plan for the relay were defects. As a result, the licensee should have assessed whether the defect – both the relay flaw and the inadequate dedication plan – could exist elsewhere in the plant or in the warehouse inventory. This review would help to identify additional plant vulnerabilities and would allow for a more appropriate assessment of whether an SSH could be created. The inspectors requested information on other locations that the same defective Nutherm dedication plan could be in place for other relays. Because the licensee had not yet completed this review, and an in depth review was required, the licensee initiated Condition Reports CR-17-03915 and CR-17-04112 to drive review of the concern. As a result of these factors, the inspectors determined that the licensee's evaluation was inadequate and that the issue should have been reportable under Part 21.

The inspectors reviewed licensee Procedure EN-LI-108, "10 CFR 21 Evaluations and Reporting," Revision 5C0, and determined it was inadequate to ensure that the correct reportability call was made for the HPCI relay failure that occurred on April 25, 2016. Specifically, the procedure (1) led the licensee to incorrectly conclude that an SSH could not be created, (2) allowed a limited extent of condition in performing the SSH evaluation such that similarly dedicated parts were not included in the scope, and (3) included incorrect guidance in Attachment 9.3. In particular, Attachment 9.3 states, "assuming that 10 CFR 21 requires an automatic application of a single failure to the redundant component or system would set a threshold for reporting under 10 CFR 21 lower than 10 CFR 50.72 and 1OCFR 50.73. Such an interpretation would be contrary to the principles in 10 CFR 21 which establish that reporting under Part 21 applies when there is a loss of safety function and when there is a major reduction in the degree of protection provided to the public health and safety." The inspectors noted that these statements were inconsistent with the guidance contained in NUREG 0302, and the requirements of Part 21. In addition, Attachment 9.3 included incorrect information from the previous revision of NUREG 1022, which discussed reporting of Part 21 defects. The information was removed for the current revision of NUREG 1022 (Revision 3), but it remained in Attachment 9.3 of the procedure. As a result of this inadequate procedure, the licensee failed to recognize that the HPCI relay defect was reportable under Part 21.

Analysis. The failure to adopt appropriate procedures to evaluate deviations and failures to comply to identify those associated with substantial safety hazards, in violation of 10 CFR 21.21(a), was a performance deficiency. The NRC's reactor oversight process considers the safety significance of findings by evaluating their potential safety consequences. Using Inspection Manual Chapter 0612, Appendix B, "Issue Screening," dated September 7, 2012, the team determined that the performance deficiency was of minor safety significance under the reactor oversight process because it involved a failure to make a report; however the underlying equipment failure was previously evaluated as having very low safety significance.

The traditional enforcement process separately considers the significance of willful violations, violations that impact the regulatory process and violations that result in actual safety consequences. Traditional enforcement applied to this finding because it involved a violation that impacted the regulatory process. The team used the NRC Enforcement Policy, dated November 1, 2016, to determine the significance of the violation. The inspectors determined that the violation was similar to Examples 6.9.d.10 and 6.9.d.13 of the Enforcement Policy, which discussed, "a failure to identify all applicable reporting codes on a Licensee Event Report that may impact the completeness or accuracy of other information submitted to the NRC," and "failure to implement adequate 10 CFR Part 21 or 10 CFR 50.55(e) processes or procedures that has more than minor safety or security significance." Specifically, although the procedure resulted in an inadequate reportability review and the issue was not reported as a manufacturing flaw, the licensee had reported some aspects of the event under the requirements of 10 CFR 50.73. As a result, the team determined that the violation should be classified as a Severity Level IV violation. Cross-cutting aspects are not assigned to traditional enforcement violations.

Enforcement. Title 10 CFR 21.21(a)(1) requires, in part, that entities subject to the regulations in this part shall adopt appropriate procedures to evaluate deviations and failures to comply to identify defects associated with SSH as soon as practicable except as provided in paragraph (a)(2) of this section, and in all cases within 60 days of

discovery, in order to identify a reportable defect that could create a substantial safety hazard, were it to remain uncorrected. Contrary to the above, prior to June 29, 2017, the licensee failed to adopt appropriate procedures to evaluate deviations and failures to comply to identify defects associated with substantial safety hazards as soon as practicable, and in all cases within 60 days of discovery, in order to identify a reportable defect that could create a substantial safety hazard, were it to remain uncorrected. Specifically, Procedure EN-LI-108, "10 CFR 21 Evaluations and Reporting," Revision 5C0, was inadequate to ensure that the correct reportability call was made for a manufacturing flaw discovered in an Allen-Bradley 700DC relay that had resulted in a loss of safety function for the HPCI system on April 25, 2016. In particular, the procedure (1) led the licensee to incorrectly conclude that an SSH could not be created, (2) allowed a limited extent of condition in performing the SSH evaluation such that similarly dedicated parts were not included in the scope, and (3) included incorrect guidance in Attachment 9.3. Corrective actions to restore compliance included re-evaluation of the defect under Part 21 requirements and a procedure adequacy review of the EN-LI-108-01 procedure. Because this violation was of Severity Level IV significance and was entered into the licensee's corrective action program as Condition Reports CR-17-3936 and CR-17-4143, this violation is being treated as a non-cited violation (NCV) in accordance with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000298/2017010-05, "Failure to adopt appropriate procedures in accordance with 10 CFR Part 21."

4OA5 Other Activities

Follow Up Inspection for Three of More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period

a. Inspection Scope

The inspectors performed Inspection Procedure (IP) 92723, "Follow Up Inspection for Three of More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period," based on the results of the NRC's annual review of station performance as documented in the 2015 assessment letter, dated March 2, 2016 (ADAMS Accession No. ML16061A312). In 2015, the NRC issued the following three Severity Level IV traditional enforcement violations in the area of impeding the regulatory process:

- NCV 05000298/2015004-02, "Failure to Update the Updated Safety Analysis Report"
- NCV 05000298/2015007-03, "Failure to Update the Final Safety Analysis Report (FSAR)"
- NCV 05000298/2015003-04, "Failure to Make a 10 CFR 50.72(b)(2)(xi) Notification"

The inspectors reviewed the licensee's cause evaluations and corrective actions associated with these issues in order to determine whether the licensee's actions met the IP 92723 inspection objectives to provide assurance that: (1) the cause(s) of the violations are understood by the licensee, (2) the extent of condition and extent of cause

of the violations are identified, and (3) licensee corrective actions to the violations are sufficient to address the cause(s).

In June 2016 the inspectors reviewed the licensee's actions to address these violations. In NRC Inspection Report 05000298/2016002 (ADAMS Accession No. ML16211A197), the inspectors documented their conclusion that objective (2) above was not met, in that the licensee did not fully identify the extent of condition and extent of cause of multiple Severity Level IV traditional enforcement violations. In this inspection (June 2017) the inspectors assessed the licensee's actions to address the weaknesses identified in the initial evaluation.

b. Assessment

The inspectors determined that the licensee's corrective actions were adequate to meet the inspection objectives. The inspectors developed the following observations with regard to the licensee's actions to meet objective (2) regarding identification of extent of condition and extent of cause.

The inspectors noted that the NCVs referenced above included five examples of failures to update the updated safety analysis report (USAR) in accordance with the requirements of 10 CFR 50.71(e). Three of these examples involved new or updated information that was included in license amendments, while two examples involved new information that was introduced in licensee procedure changes. The inspectors determined that the licensee's initial extent of condition evaluation included a review of a sample of license amendments to determine whether additional examples of failures to make appropriate corresponding updates to the USAR existed. The inspectors observed that the initial evaluation did not include a sample output of any other change processes by which new or updated information affecting the content of the USAR could be developed, such as licensee procedure changes. The inspectors determined that the licensee supplemented their extent of condition evaluation to include a sample of procedure revisions to determine whether corresponding USAR updates were implemented, if applicable. The licensee's evaluation also acknowledged that other change process output (e.g. engineering evaluations, plant modifications, and design changes) could result in the need for a USAR update. The licensee's evaluation included a search for past condition reports documenting problems in these areas. The license also performed a review of three USAR sections against other applicable licensing basis documentation to verify accuracy and consistency of USAR content.

The inspectors also observed that, for the identified cause of, "failure to apply the proper rigor for regulatory requirements associated with USAR maintenance," the licensee's initial extent of cause evaluation did not assess the applicability of the cause for other programs or activities, such as whether proper rigor is being applied for maintaining licensee-controlled licensing basis documents other than the USAR. The inspectors determined that the licensee supplemented their extent of cause evaluation to include a sample of the last 3 years of revisions to licensing basis documents other than the USAR (e.g. Technical Specifications (TS) Bases, Technical Requirements Manual) to determine whether the changes were made properly (in accordance with established processes and procedures) and accurately (in accordance with the information that prompted the need for the change.)

The inspectors determined that the licensee's extent of condition evaluation did not include any independent sample of change process output other than license amendments and procedure changes, and the licensee's extent of cause evaluation did not include an effort to identify potential instances where no licensing basis document change occurred when there should have been, based on new or updated information being issued. The licensee entered these observations into the corrective action program as Condition Report CR-CNS-2017-04036.

c. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On June 29, 2017, the inspectors presented the inspection results to Mr. J. Kalamaja, General Manager Plant Operations and then-acting Vice President and Chief Nuclear Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

R. Aue, Employee Concerns Program Coordinator
T. Barker, EP&C Manager
T. Chard, Quality Assurance Manager
L. Dewhirst, CA&A Manager
J. Dykstra, EP&C Engineer
J. Ehlers, System Engineering Supervisor
T. Forland, Licensing Engineer
E. Fulton, System Engineer
S. Gocek, Design Engineer
D. Kiekel, Design Engineer
M. Metzger, System Engineer
J. Reimers, System Engineering Manager
J. Shaw, Licensing Manager
R. Shaw, Assistant Operations Manager – Support
D. Van Der Kamp, Licensing Technical Specialist

NRC Personnel

C. Henderson, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000298/2017010-01	NCV	Failure to Assign Corrective Actions to Prevent Recurrence of High Pressure Coolant Injection Failure (Section 4OA2.5.a)
05000298/2017010-02	NCV	Failure to Perform Timely Operability Determinations (Section 4OA2.5.b)
05000298/2017010-03	NCV	Programmatic Failure to Identify and Correct Adverse Trends (Section 4OA2.5.c)
05000298/2017010-04	NCV	Failure to Monitor No. 2 Diesel Generator under 50.65(a)(1) due to Inadequate Maintenance Rule Evaluation (Section 4OA2.5.d)
05000298/2017010-05	NCV	Failure to adopt appropriate procedures in accordance with 10 CFR Part 21 (Section 4OA2.5.e)

LIST OF DOCUMENTS REVIEWED

Quality Surveillances
QS-2017-CNS-016
QS-2016-CNS-003

Condition Reports

12-03456	15-02747	16-01485	16-05717	16-09041	17-02533
12-03456	15-03008	16-01523	16-05963	16-09048	17-02544
12-05871	15-03188	16-01647	16-06000	16-09126	17-02599
12-06346	15-03292	16-02183	16-06056	17-00002	17-02638
12-06369	15-03292	16-02191	16-06109	17-00039	17-02708
12-06417	15-03672	16-02217	16-06185	17-00185	17-02708
12-07528	15-03786	16-02281	16-06185	17-00278	17-02714
12-07529	15-03787	16-02281	16-06497	17-00322	17-02715
12-09106	15-03788	16-02318	16-06582	17-00373	17-02718
12-09529	15-04229	16-02401	16-06604	17-00373	17-02794
12-09908	15-04417	16-02402	16-06605	17-00408	17-02875
13-00474	15-04418	16-02402	16-06901	17-00426	17-03182
13-00475	15-04801	16-02424	16-07042	17-00472	17-03267
13-00475	15-05006	16-02589	16-07044	17-00474	17-03400
13-01500	15-05056	16-02638	16-07329	17-00551	17-03481
13-01500	15-05167	16-02753	16-07426	17-00610	17-03505
13-03145	15-05190	16-03413	16-07494	17-01168	17-03539
13-03456	15-05217	16-03434	16-07634	17-01169	17-03544
13-03591	15-05357	16-03665	16-07645	17-01195	17-03570
13-05836	15-05831	16-03665	16-07742	17-01227	17-03573
13-07276	15-06036	16-03708	16-07991	17-01370	17-03610
14-01622	15-06240	16-03780	16-08112	17-01405	17-03703
14-06170	15-06281	16-03783	16-08122	17-01430	17-03706
14-07389	15-06477	16-03874	16-08122	17-01457	17-03711
14-08117	15-06547	16-04104	16-08156	17-01668	17-03714
14-08656	15-06873	16-04137	16-08319	17-01718	17-03718
15 03672	15-06877	16-04355	16-08337	17-01741	17-03721
15-00403	16 01282	16-04487	16-08338	17-02067	17-03730
15-01179	16-00075	16-04628	16-08363	17-02091	17-03883
15-01268	16-00227	16-04649	16-08369	17-02280	17-03915
15-01908	16-00498	16-04705	16-08373	17-02289	17-03917
15-02085	16-00716	16-05196	16-08461	17-02383	17-03920
15-02337	16-00815	16-05361	16-08493	17-02412	17-03934
15-02387	16-00905	16-05558	16-08539	17-02419	17-03936
15-02718	16-01227	16-05607	16-08744	17-02428	17-04036
15-02736	16-01282	16-05628	16-08905	17-02430	17-04112

Other

LO-2015-0004-021	LO-2016-0062-002	LO-2017-0010-004	LO-2017-0010-029
LO-2015-0004-022	LO-2017-0010-003	LO-2017-0010-005	LO-2017-0010-031
LO-2017-0010-034	LO-2017-0010-042	LO-2017-0134	
LO-2017-0010-041	LO-2017-0010-045	OLC 2016-0071-029	

Work Orders

4717267	4923199	5035100	5115933	5152489	5162880
4747977	4923240	5045188	5129400	5155046	5170176
4818769	4924316	5064347	5129938	5155419	5186551
4858438	4934981	5070290	5130230	5157275	5192179

Procedures

Number	Title	Revision
0.29.1	Licensing Basis Document Changes	35
0.29.2	USAR Control and Maintenance	21
0.4	Procedure Change Process	65
0.5OPS	Operations Review of Condition Reports/Operability Determination	57
0-CNS-FAP-LI-001	Performance Improvement Review Group (PRG) Process	0
0-CNS-LI-102	Corrective Action Process	3-7
0-CNS-LI-118	Cause Evaluation Process	0
0-CNS-WM-100	Work Order Generation, Screening, and Classification	7
0-EN-LI-100	Process Applicability Determination	18C1
0-QA-01	CNS Quality Assurance Program	22
15.SUMP.101	Sump Pump Operability Test	25
2.0.11	Entering and Exiting Technical Specification/TRM/ODAM LCO Condition(s)	41
2.0.11.1	Safety Function Determination Program	9
2.0.12	Operator Challenges	10-11
2.0.2	Operations Logs and Reports	111
2.1.10	Station Power Changes	113
2.2.20	Standby AC Power System (Diesel Generator)	95
2.2.33	High Pressure Coolant Injection System	79

Procedures

Number	Title	Revision
2.2.33A	High Pressure Coolant Injection System Component Checklist	29
2.2.68.1	Reactor Recirculation System Operations	81
3.4.4	Temporary Configuration Change	19
3-EN-DC-203	Maintenance Rule Program	3C0
3-EN-DC-204	Maintenance Rule Scope and Basis	3C0
3-EN-DC-205	Maintenance Rule Monitoring	5C0
3-EN-DC-206	Maintenance Rule (a)(1) Process	3C1
3-EN-DC-207	Maintenance Rule Periodic Assessment	3C0
5.1ASD	Alternate Shutdown	18
6.PC.203	Tip Ball Valve Exercising and Timing Test (IST)	9
6.PCIS.302	Group 1, Group 7, and Mechanical Vacuum Pump Isolation Logic Functional Test	15
7.0.14	Predictive Maintenance Program	7
7.2.51.1	Air-Operator Valve Actuator Setup/Testing	22
98-03-02	System Engineering Desktop Guide Section II – Identification of Critical Components	5
DGHV-PF04	Maintenance Rule System Basis Document – Diesel Generator HVAC Function 4	2
DG-PF01	Maintenance Rule System Basis Document – Diesel Generator Function 1	5
DGSA-PF01	Maintenance Rule System Basis Document – Diesel Generator Starting Air Function 1	3
EN-DC-178	System Walkdowns	4C0
EN-LI-108-01	10 CFR 21 Evaluations and Reporting	5C0
EN-LI-118	Cause Evaluation Process	22

Other Documents

Number	Title	Revision/Date
	List of HPCI Maintenance Rule Functional Failures	May 2017
	List of PCI Maintenance Rule Functional Failures	May 2017
	HPCI and PCI Surveillance Performance History	May 2017
	Cooper Nuclear Station Nuclear Safety Culture Assessment	May 2017
	List of relays associated with Material Master MM2049261 and MM2107105	June 29, 2017
	Nuclear Safety Culture Assessment	May 31, 2017
12186-DD-01	Nutherm Dedication Documentation Package for Allen-Bradley Auxiliary Relays	0
14194-DD-01	Nutherm Dedication Documentation Package for Allen-Bradley Auxiliary Relays	0 & 1
6.HPCI.103	HPCI IST and 92 Day Test Mode	April 20, 2017 July 19, 2016 July 25, 2014 July 26, 2012 September 9, 2014 September 21, 2012
98-03-05	System Engineer Desktop Guide – System Trending	10
ANSI/IEEE C37.90-1989	IEEE Standard for Relays and Relay Systems Associated with Electric Power Apparatus	December 7, 1989
CC05920	Air Operated Control Valve	
EE 13-041	Turbine Building Blowout Panels/Metal Wall System	3
ESC 88-330	Documentation of DG Lube Oil and Jacket Water Motors	December 27, 1988
HPCI	HPCI System Health Report	March 2017
HPCI-PF01	Maintenance Rule System Basis Document – HPCI System Function 1	4

Other Documents

Number	Title	Revision/Date
HV-F16	Maintenance Rule System Basis Document – Control Room Emergency Filtration System Function	3
IST RAL	Inservice Testing Reference Acceptance Limits Data File	219
LO 2015-0184-003	ISFSI Self-Assessment	October 9, 2015
LO 2015-201-003	Occupational ALARA Planning and Controls (IP-71124.02) and Occupational Dose Assessment (IP-71124.04)	January 15, 2016
MPR Associates Letter	Cooper-Bessemer Model KSV Diesel Engine Operating Temperature Ranges	March 26, 1998
MR (a)(1)	Maintenance Rule (a)(1) Summary	May 2017
MR 1Q2017	Maintenance Rule Program Health Report	April 5, 2017
MS-F04 (a)(1) Plan	Maintenance Rule (a)(1) Evaluation and Action Plan CR 16-07742	December 15, 2017
NEDC 13-028	Ultimate Internal Pressure of Turbine Building Blowout Panels and Metal Wall System	March 23, 2016
NEDC 16-028	Operability Analysis of Residual Heat Removal Service Water B Piping Minimum Thickness	2
NEDC 91-239	DGLO/DGJW/DG Intercooler Heat Exchanger Evaluation	5
NEDC 94-021	REC-HX-A & REC-HX-B Maximum Allowable Accident Case Fouling	7
NMT-F02 (a)(1) Plan	Maintenance Rule (a)(1) Evaluation and Action Plan CR 17-00039	0
OC MNT	Online Corrective Maintenance Backlog	May 2017
OD MNT	Online Deficient Maintenance Backlog	May 2017
PC	Primary Containment System Health Report	December 2016

Other Documents

Number	Title	Revision/Date
PC-COMP1	Maintenance Rule System Basis Document – Primary Containment Components Function 1	3
PC-CONT1	Maintenance Rule System Basis Document – Primary Containment Leakage Function 1	4
PC-CONT2A	Maintenance Rule System Basis Document – Primary Containment Leakage Function 2A	5
PC-CONT2B	Maintenance Rule System Basis Document – Primary Containment Leakage Function 2B	4
PC-F01	Maintenance Rule System Basis Document – Primary Containment Function 1	4
PC-F02	Maintenance Rule System Basis Document – Primary Containment Function 2	4
PC-F03	Maintenance Rule System Basis Document – Primary Containment Function 3	3
PC-F04	Maintenance Rule System Basis Document – Primary Containment Function 4	4
PC-F05	Maintenance Rule System Basis Document – Primary Containment Function 5	3
PC-F07	Maintenance Rule System Basis Document – Primary Containment Function 7	3
PC-F08	Maintenance Rule System Basis Document – Primary Containment Function 8	3
PC-F09	Maintenance Rule System Basis Document – Primary Containment Function 9	3
PC-F10	Maintenance Rule System Basis Document – Primary Containment Function 10	4
PCI Trend	Primary Containment System Engineer MOV Trend Data	January 7, 2016
PCLRT	Primary Containment Leakage Rate Testing Program Document	22

Other Documents

Number	Title	Revision/Date
PCR 2.2.20 Rev. 37	Procedure Change Notice for System Operating Procedure 2.2.20	37
PCR 2.2.20 Rev. 71	Procedure Change Request for System Operating Procedure 2.2.20	71
QAD 2016-0001	QA Audit 15-10 "Training"	January 7, 2016
QAD20150015	QA Audit 15-05, "Maintenance"	August 5, 2015
QAD20160009	QA Audit 16-02, "Engineering"	April 6, 2016
REC-F01	Maintenance Rule System Basis Document – Reactor Equipment Cooling Noncritical Function 1	4
REC-PF01	Maintenance Rule System Basis Document – Reactor Equipment Cooling Critical Function 1	3
RMA-F02 (a)(1) Plan	Maintenance Rule (a)(1) Evaluation and Action Plan CR 17-02637	0

J. Dent

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