UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-4511

August 2, 2012

Brian J. O'Grady, Vice President-Nuclear
and Chief Nuclear Officer
Nebraska Public Power–Cooper
Nuclear Station
72676 648A Avenue
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION–NRC INTEGRATED INSPECTION REPORT 05000298/2012003

Dear Mr. O'Grady:

On June 26, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Cooper Nuclear Station. The enclosed inspection report documents the inspection results which were discussed on June 25, 2012, with A. Zaremba, Director of Nuclear Safety Assurance, and other members of your staff.

The inspections examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Eleven NRC-identified and three self-revealing findings of very low safety significance (Green) were identified during this inspection.

Thirteen of these findings were determined to involve violations of NRC requirements. Further, licensee-identified violations which were determined to be of very low safety significance are listed in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at 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 Regional Administrator, Region IV; and the NRC Resident Inspector at Cooper Nuclear Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Vince Gaddy, Branch Chief
Project Branch C
Division of Reactor Projects

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

Enclosure: Inspection Report 05000298/2012003
w/ Attachment:
1. Supplemental Information
2. Information Request for inspection activities documented in 2RS2, 2RS4 and 4OA5

cc w/ encl: Electronic Distribution

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SUNSI Rev Compl.	☒Yes ☐ No	ADAMS	☑Yes ☐ No	Reviewer Initials	VGG
Publicly Avail.	☒Yes ☐ No	Sensitive	☐Yes ☒ No	Sens. Type Initials	VGG

SRI:DRP/C	RI:DRP/C	SPE:DRP/C	C:DRS/EB1	C:DRS/EB2	C:DRS/OB
JJosey	CHenderson	BHagar	TRFarnholtz	GMiller	MSHaire
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000298
License:	DRP-46
Report:	05000298/2012003
Licensee:	Nebraska Public Power District
Facility:	Cooper Nuclear Station
Location:	72676 648A Ave Brownville, NE 68321
Dates:	March 28, 2012 through June 26, 2012
Inspectors:	J. Josey, Senior Resident Inspector C. Henderson, Resident Inspector B. Hagar, Senior Project Engineer G. George, Senior Reactor Inspector L. Carson II, Senior Health Physicist C. Alldredge, Health Physicist G. Pick, Senior Reactor Inspector
Approved By:	Vince Gaddy, Chief Project Branch C Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000298/2012003; 03/28/2012–06/26/2012; COOPER NUCLEAR STATION, Integrated Resident and Regional Report; Maintenance Effectiveness, Maintenance Risk Assessments & Emergent Work Control, Operational Evaluations and Functionality Assessments, Plant Modifications, Surveillance Testing, Occupational ALARA Planning and Controls, Problem Identification and Resolution, Other Activities.

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region-based inspectors. Thirteen Green non-cited violations and one Green finding of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The cross-cutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors documented a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the failure to develop and specify adequate postmaintenance testing requirements in work instructions used to perform maintenance on Diesel Generator 1. Specifically, in October 2011, Work Order 4766672 did not specify adequate postmaintenance testing instructions to verify that the left bank air distributor was properly re-installed following a change in work scope. This issue was entered into the licensee's corrective action program as Condition Reports CR-CNS-2012-02532 and CR-CNS-2012-02566.

  The licensee's failure to establish adequate work instructions, to include post maintenance testing requirements to verify equipment operability following maintenance, was a performance deficiency. The performance deficiency was more than minor because it affected the procedure quality attribute of the Mitigating Systems Cornerstone, and directly affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding screened as potentially risk significant since the finding represented an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time. When evaluated per Inspection Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and the Cooper Phase 2 pre-solved table item, "EDG1," the inspectors determined this finding to be of very low safety

significance (Green). This finding had a cross-cutting aspect in the area of human performance associated with the resources component, because the licensee failed to provide complete, accurate and up-to-date work packages that specified the appropriate postmaintenance testing requirements following work scope change [H.2(c)](Section 1R12).

- Green. The inspectors documented a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the failure to ensure compliance with the requirements of the station's troubleshooting plan generated in accordance with Procedure 7.0.1.7, Revision 15, "Troubleshooting Plant Equipment." Specifically, licensee personnel failed to ensure that ground isolated test equipment was used during troubleshooting activities that affected the 250 Vdc bus. The licensee entered this deficiency into their corrective action program for resolution as Condition Report CR-CNS-2012-02717.

  The failure to follow the troubleshooting plan was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore, a finding. Specifically, the licensee failed to ensure that ground isolated test equipment was used as specified in the troubleshooting plan contained in Work Order 4863518, "Troubleshooting SS-IVTR-UPS2 and Transfer Switch," causing a ground and 0.8 volt drop on the 250 Vdc Bus 1A. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions and conduct effectiveness reviews to validate the underlying assumptions that ground isolated test equipment was used as specified in the troubleshooting plan [H.1(b)](Section 1R13).

- Green. The inspectors identified two examples of a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the failure of the licensee to recognize the need for an evaluation and to properly document the bases for operability when a degrading nonconforming condition was identified. Specifically, the licensee did not consider all relevant information when assessing: (1) Diesel Generator 1 jacket water heater seismic operability with only two bolts fully engaged and; (2) the

impact of a free floating absorbent bag discovered in the Diesel Generator 2 room sump for internal flooding analysis for a medium energy line break. The licensee entered these issues into their corrective action program for resolution as Condition Reports CR-CNS-2012-03137 and CR-CNS-2012-02767.

The licensee's failure to recognize the need for an evaluation and to properly document the bases for operability when a degraded nonconforming condition was identified was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions and conduct effectiveness reviews to validate the underlying assumptions when determining Diesel Generator 1 jacket water heater seismic operability with only two bolts fully engaged and impact of a free floating absorbent bag in Diesel Generator 2 room sump for internal flooding analysis for a medium energy line break [H.1(b)](Section 1R15).

- Green. The inspectors identified two examples of a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with the licensee's failure to: (1) assure that the applicable seismic design basis requirements associated with the standby liquid control system storage tank was correctly translated into the plant design to ensure that the standby liquid control system would remain operable following a seismic event and; (2) maintain design control of sumps credited in the station's internal flooding analysis. These issues were entered into the licensee's corrective action program as Condition Reports CR-CNS-2012-01918 for the standby liquid storage tank and CR-CNS-2012-02414, CR-CNS-2012-02509, CR-CNS-2012-02510, CR-CNS-2012-02752, and CR-CNS-2012-02767 for the oil absorbent bags.

  The licensee's failure to maintain design control of the standby liquid control system and sumps credited for the station's internal flooding analysis was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond

to initiating events to prevent undesirable consequences, and is therefore a finding. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action component because: (1) the licensee failed to thoroughly evaluate concerns with seismic analysis of the standby liquid control system such that the resolution addresses causes an extent of conditions, as necessary, during the development of NEDC 12-015; and (2) the licensee had the opportunity in 2010 and early 2012 during reviews of the internal flooding analysis to identify that oil absorbent bags contained in the sumps credited in the internal flooding analysis did not contain an analysis and were an unapproved modification [P.1(c)](Section 1R15).

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVII, "Quality Assurance Records," associated with the licensee's failure to furnish evidence of an activity affecting quality associated with the emergency diesel generator jacket water cooling pumps. Specifically, the licensee failed to maintain design documents that detailed the amount of net positive suction head required for the diesel generator jacket water pumps to ensure that at the current low level alarm set point the pumps would not cavitate and potentially be damaged. The licensee generated a bounding operability evaluation to address this issue. This issue was entered into the licensee's corrective action program as Condition Reports CR-CNS-2012-03262, and CR-CNS-2012-03305.

  The licensee's failure to furnish evidence that showed the required net positive suction head for the jacket water pump was maintained at the current low level alarm set point was a performance deficiency. The performance deficiency was determined to be more than minor because it affected the design control attribute of the Mitigating Systems Cornerstone, and it directly affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Using Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it was not a design or qualification issue confirmed not to result in a loss of operability or functionality; did not represent an actual loss of safety function of system or train; did not result in the loss of one or more trains of nontechnical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or a severe weather initiating event. This finding did not have a cross-cutting aspect because the

most significant contributor of this finding did not reflect current licensee performance (Section 1R15).

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with the licensee's failure to ensure that design changes were subject to design control measures commensurate with those applied to the original design and were approved by the designated responsible organization. Specifically, the licensee received a design level calculation from a vendor in support of service water pump C change out, but failed to appropriately review, accept and enter this calculation into their design basis. This issue was entered into the licensee's corrective action program as Condition Report CR-CNS-2012-03634.

  The licensee's failure to ensure that changes to the facility were subject to design control measures commensurate with those applied to the original design, and were approved by the designated responsible organization was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Using Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. This finding had a cross cutting aspect in the area of human performance associated with the work practices component, because the licensee failed to adequately define and effectively communicates expectations regarding procedural compliance and personnel failed to follow procedures. Specifically, engineering department personnel failed to follow station procedures when receiving a new design basis calculation from a vendor [H.4(b)] (Section 1R15).

- Green. The inspectors identified four examples of a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to follow the requirements of station Procedure 0.8, "10CFR50.59 and 10CFR72 .48 Reviews," and evaluate changes made to safety related components for adverse impacts. Specifically, the inspectors identified four instances where the licensee personnel in multiple work groups failed to follow the requirements of station Procedure 0.8 and evaluate changes being made to safety related components for potentially adverse impacts prior to implementing these changes. This issue was entered into the licensee's corrective action program as Condition Reports

CR-CNS-2012-02750, CR-CNS-2012-03366, CR-CNS-2012-03806, CR-CNS-2012-04033, and CR-CNS-2012-04456.

The failure of station personnel to follow the requirements of station Procedure 0.8, "10CFR50.59 and 10CFR72 .48 Reviews," for modifications to safety related equipment was a performance deficiency. The performance deficiency was determined to be more than minor because if left uncorrected, the continued practice of modifying the facility without evaluating for adverse impacts had the potential to lead to a more significant safety concern. Specifically, unevaluated modifications to the facility could introduce adverse changes that result in systems not able to perform their intended safety function which would not be recognized. This finding affects the Mitigating Systems Cornerstone. Using Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of the system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; and (4) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate it is unsafe in order to disapprove the action [H.1(b)](Section 1R18).

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Controls," for the licensee's non-conservative service water booster pump A and D differential pressure operability limits. The licensee entered this deficiency into their corrective action program for resolution as Condition Report CR-CNS-2012-02497 and CR-CNS-2012-02500.

  The licensee's nonconservative service water booster pump A and D differential pressure operability limits was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the procedural quality attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Specifically, the pump differential pressure operability limit for service water booster pump A and D was not correctly stated in the In-service Testing program so that the pumps would meet their 30 day mission time for a design basis accident with a degrading pump differential pressure. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not

represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross cutting aspect in the area of problem identification and resolution associated with the corrective action component because the licensee failed to thoroughly evaluate concerns with operability limit for service water booster pump A and D such that the resolution address causes an extent of conditions, as necessary. Specifically, operability lower limit was identified during the initiation of Condition Report CR-CNS-2011-07980, but the licensee failed to update the operability limits during the review of the condition report [P.1(c)](Section 1R22).

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," for the licensee's failure to prepare an adequate design calculation demonstrating that a single diesel generator starting air accumulator was capable of performing multiple starts of an emergency diesel generator. The licensee entered this deficiency into their corrective action program for resolution as Condition Report CR-CNS-2012-03039.

  The licensee's failure to prepare an adequate design calculation demonstrating that a single diesel generator starting air accumulator was capable of performing multiple starts of an emergency diesel generator was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions and conduct effectiveness reviews to validate the underlying assumptions when determining the number of multiple starts on one diesel generator starting air accumulator [H.1(b)](Section 4OA2).

- Green. The inspectors identified a non-cited violation of 10 CFR 50 Part 50, Appendix B, Criterion III, "Design Control," associated with the licensee's failure to ensure that the control building's essential ventilation system would maintain battery room temperatures such that the batteries would remain operable under all design conditions. Specifically, the essential ventilation system does not

provide a heat source for the battery rooms and during cold weather conditions cannot maintain room temperatures above the minimum required for operability without the use of portable heaters. This issue was entered into the licensee's corrective action program as Condition Report CR-CNS-2012-00724.

The licensee's failure to ensure that the essential ventilation system would support battery operability under all design conditions was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Using Manual Chapter 0609, Attachment 4, "Phase 1 Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or server weather initiating event. This finding had a cross-cutting aspect in the area of human performance associated with the decision-making component because the licensee failed to conduct adequate effectiveness reviews of safety-significant decisions to verify the validity of the underlying assumptions, and identify possible unintended consequences. Specifically, the licensee failed to recognize the use of portable heaters as a manual action which indicated an inadequate ventilation design [H.1(b)] (Section 4OA2).

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," associated with the licensee's failure to ensure that design bases parameters documented in the Updated Safety Analysis Report were used for station activities. Specifically, the licensee based an operability evaluation and a door breach sensitivity study on a parameter value determined in a calculation instead of the value documented in the Updated Safety Analysis Report because they failed to recognize information in Final Safety Analysis Report Amendment 25 that described the turbine building sidings response to a high energy line break as design bases information. This issue was entered into the licensee's corrective action program as Condition Reports CR-CNS-2011-10391 and CR-CNS-2011-11861.

  The licensee's failure to maintain design control when performing an operability evaluation and sensitivity study, with respect to the turbine building high energy line break analysis, is a performance deficiency. This performance deficiency was determined to be more than minor because if left uncorrected, the licensee's practice of basing design-related analyses on parameter values that don't represent the design bases has the potential to lead to a more significant safety concern. Specifically, if the licensee bases analyses on a particular parameter

value that doesn't represent the design bases and if that parameter value differs from the corresponding design-basis value in a nonconservative manner, then the licensee could reasonably complete an operability assessment based on the nonconservative parameter value and determine that a safety-related system is operable, when an operability assessment based on the design-basis parameter value would have determined that the system is inoperable. As a result, a safety-related system could remain in an undetected inoperable state for an indefinite period of time, and is therefore a finding. Using Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the inspectors determined this finding has very low safety significance (Green) because it: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; and (4) did not screen as potentially risk-significant due to seismic, flooding, or a severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision-making component because the licensee failed to use conservative assumptions in decision making when they failed to recognize and control design bases information [H.1(b)] (Section 4OA5).

Cornerstone: Occupational Radiation Safety

- Green. The inspectors identified a non-cited violation of Technical Specification 5.4.1, associated with station personnel's failure to follow radiation work permit requirements. Specifically, inspectors observed workers breaching a contaminated system during planned maintenance activities without radiation protection personnel present as specified by the radiation work permit requirements. This issue was entered into the licensee's corrective action program as Condition Report CR-CNS-2012-02716.

  The inspectors determined that the failure of craft personnel to follow radiation work permit requirements when breaching contaminated systems was a performance deficiency. The performance deficiency was determined to be more than minor because if left uncorrected, the continued failure of craft personnel to follow radiation work permit requirements when breaching contaminated systems could become more significant, in that, it could lead to personnel contamination events and unplanned/unexpected dose, and is therefore a finding. The finding was associated with the Occupational Radiation Safety Cornerstone. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspector determined the finding to be of very low safety significance because: (1) it was not associated with as low as reasonably achievable (ALARA) planning or work controls; (2) there was no overexposure; (3) there was no substantial potential for an overexposure; and (4) the ability to assess dose was not compromised. The finding has a cross-cutting aspect in the area of human performance associated with the decision-making component because workers failed to use conservative

assumptions in decision making when breaching a contaminated system for maintenance [H.1(b)](Section 1R22).

- Green. The inspectors reviewed a self-revealing, non-cited violation of 10 CFR 20.1501(a) for the failure to perform adequate radiation and contamination surveys. Specifically, a survey was not performed prior to power washing the reactor vessel studs during reactor cavity decontamination work as part of Refueling Outage 26. The absence of a survey resulted in an unanticipated airborne radioactivity area and unintended, unplanned dose to five workers. The issue was documented in Condition Report CR-CNS-2011-04891.

  The failure to perform a survey to evaluate the radiological conditions is a performance deficiency. The finding is more than minor because it negatively impacted the Occupational Radiation Safety Cornerstone attribute of program and process, in that, the lack of a survey did not ensure exposure control for workers. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance because: (1) it was not associated with ALARA planning or work controls; (2) there was no overexposure; (3) there was no substantial potential for an overexposure; and (4) the ability to assess dose was not compromised. This finding has a cross-cutting aspect in the area of human performance associated with the decision-making component because the radiation protection manager and cavity decontamination supervisor did not fully use radiological job plans and controls. Specifically, the radiation protection manager and cavity decontamination supervisor made the decision to power wash the vessel studs without using a written work plan [H.1.a](Section 2RS2).

- Green. Inspectors identified a finding of very low safety significance for the failure to follow ALARA planning and control procedures to maintain doses ALARA for refueling floor activities covered under Radiological Work Package 2011-05. Specifically, the licensee failed to follow an ALARA planning and work control procedure by not planning, evaluating, and implementing strategies to minimize dose increases to justify increases in the estimated collective dose. Consequently, there was an overage of 20 person-rem of unintended dose, which exceeded the dose estimate by 80 percent. The original dose estimate was 25 person-rem and actual dose was 45 person-rem. The finding and procedure concerns were documented in the licensee's corrective action program as Condition Reports CR-CNS-2012-02551 and CR-CNS-2012-02652.

  The failure to follow the ALARA planning and controls procedure to prevent unplanned and unintended collective doses was a performance deficiency. This finding is greater than minor because it affected the Occupational Radiation Safety Cornerstone attribute of program and process, in that, failure to implement ALARA procedures adequately caused increased collective radiation dose for the job activity to exceed 5 person-rem and exceeded the planned dose by more than 50 percent. In addition, this type of issue is addressed in Example 6.j of

Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues." Using the Occupational Radiation Safety Significance Determination Process, the inspectors determined that this finding was of very low safety significance because it involved ALARA planning and controls and the licensee's latest rolling three-year average does not exceed 240 person-rem. This finding has a cross-cutting aspect in the area of human performance associated with the work control component because the licensee failed to evaluate the impact of work scope changes on human performance and interdepartmental communication and coordination prior to commencing work activities. Specifically, work groups, Health Physics, and the ALARA Planners did not effectively communicate how work scope changes of the radiation work permits would affect the dose estimate of the radiological work package [H.3.b](Section 2RS2).

B. Licensee-Identified Violations

Violations of very low safety significance which were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and associated corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Cooper Nuclear Station began the inspection period at full power on March 28, 2012. On June 11, 2012, power was lowered to approximately 30 percent for single loop operation while repairs were made to the reactor motor generator set 1A ventilation system. On June 13, 2012, power was increased to 100 percent and remained there for the remainder of the reporting period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Summer Readiness for Offsite and Alternate-ac Power

a. Inspection Scope

The inspectors reviewed preparations for summer weather for selected systems, including conditions that could lead to loss-of-offsite power and conditions that could result from high temperatures. The inspectors reviewed the procedures affecting these areas and the communications protocols between the transmission system operator and the plant to verify that the appropriate information was being exchanged when issues arose that could affect the offsite power system. Examples of aspects considered in the inspectors' review included:

- The coordination between the transmission system operator and the plant's operations personnel during off-normal or emergency events
- The explanations for the events
- The estimates of when the offsite power system would be returned to a normal state
- The notifications from the transmission system operator to the plant when the offsite power system was returned to normal

During the inspection, the inspectors focused on plant-specific design features and the procedures used by plant personnel to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report and performance requirements for systems selected for inspection and verified that operator actions were appropriate as specified by plant-specific procedures. Specific documents reviewed during this inspection are listed in the attachment. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures.

The inspectors' reviews focused specifically on the following plant systems:

- June 11, 2012, 161 kV switchyard

These activities constitute completion of one readiness for summer weather affect on offsite and alternate-ac power sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

.2 Readiness to Cope with External Flooding

a. Inspection Scope

Because the Cooper Nuclear Station is potentially vulnerable to flooding from high-water levels in the Missouri River, and because the U.S. Army Corps of Engineers Upper Mississippi River Task Force published their "Upper Mississippi River System Flow Frequency Study Final Report," dated January 2004, which suggested that the probable maximum flood level expected at Cooper Nuclear Station could be higher than the probable maximum flood level to which the plant had been designed, the inspectors reviewed calculation NEDC-11-076, "External Flood Events Review", Revision 1, to verify both that the calculational framework was valid, and that the calculation's results did not invalidate the design-basis probable maximum flood for Cooper Nuclear Station. Specifically, the inspectors reviewed how the licensee's contractor had developed a new hydrodynamic computer model of the Missouri River channel and adjacent floodplains for a region that extended from approximately 9 miles upstream to approximately 34 miles downstream of Cooper Nuclear Station, to verify that the model had been developed in accordance with the HEC-RAS River Analysis System User's Manual, Version 4.1. Additionally, the inspectors reviewed how licensee contractors had acquired and used updated topographical data that characterized the Missouri River basin for use in the model. The inspectors also reviewed the boundary conditions used with that model to predict water surface elevations and flow velocities impacting the plant for the following flow events:

- the 500-year event from the "Upper Mississippi River System Flow Frequency Study Final Report," dated January 2004, prepared by the U.S. Army Corps of Engineers Upper Mississippi River Task Force,

- the design-basis probable maximum flood event described in the Cooper Nuclear Station Updated Safety Analysis Report, and

- the probable maximum flood + Fort Randall Dam failure event from the "Fort Randall Dam, Missouri River; Pickstown, South Dakota, Critical Infrastructure Security Program, Dam Failure Analyses, H&H Methodology and Consequences Summary," dated February 2010, prepared by the U.S. Army Corps of Engineers Omaha District. (The licensee analyzed this flow event because its peak

discharge flow rate was similar to the estimated peak flow rate described in the USAR.)

Furthermore, the inspectors compared the new Cooper Nuclear Station model to the Federal Emergency Management Administration Flood Insurance Studies model that had been prepared by the U.S. Army Corps of Engineers Omaha District in August 2010, to verify that the Cooper Nuclear Station model included recently established parameters that describe cross-sectional areas, flood storage volumes, and roughness coefficients of the Missouri River basin. Finally, the inspectors compared the water surface elevations obtained by analyzing the new Cooper Nuclear Station model for the flow events listed above, with the probable maximum flood value listed in the Cooper Nuclear Station USAR, to verify that the water surface elevations obtained by analyzing the new Cooper Nuclear Station model did not exceed the probable maximum flood value in the USAR.
The inspectors also inspected the condition report with which this calculation is associated. That inspection is described in section 4OA2 of this report.

These activities constitute completion of one external flooding sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- June 1, 2012, Reactor equipment cooling heat exchanger A and B, pumps A, B, C, and D; isolation valves credited in the Updated Safety Analysis Report
- June 14, 2012, Residual heat removal and core spray suction piping; RHR-MOV-MO39A and B gear ratio change
- June 13, 2012, Service water pump C

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in

order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On June 13, 2012, the inspectors performed a complete system alignment inspection of the diesel generators to verify the functional capability of the system. The inspectors selected this system because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors inspected the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- April 12, 2012, Core spray pump room, southeast quad, Fire Area 1, Zone 1B
- April 16, 2012, Diesel generator room 1B, Fire Area X, Zone 14B and 14D
- April 17, 2012, Residual heat removal service water booster pump and service air compressor, Fire Area IV, Zone 7A
- April 18, 2012, Residual heat removal pump room 1A and 1C, northwest quad, Fire Area 1, Zone 1C

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On May 24, 2012, the inspectors observed a fire brigade activation on the 903 feet elevation level of the Reactor Building, north east quad. The observation evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient firefighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of preplanned strategies; (9) adherence to the preplanned drill scenario; and (10) drill objectives.

These activities constitute completion of one annual fire-protection inspection sample as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also inspected the areas listed below to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

- June 5, 2012, Manhole P3 and C4

These activities constitute completion of one bunker/manhole sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T) Triennial Review

a. Inspection Scope

The inspectors reviewed design documents (e.g., calculations and performance specifications), program documents, test and maintenance procedures, chemistry trends, and corrective action documents for the inspection samples selected. The inspectors interviewed chemistry and engineering personnel.

The inspectors selected heat exchangers that were directly or indirectly connected to the safety-related service water system. The inspectors selected the following heat exchangers:

- Division 2 Residual Heat Removal Heat Exchanger
- Divisions 1 and 2 Reactor Equipment Cooling Heat Exchanger
- Diesel Generator 2 Jacket Water and Lube Oil Heat Exchangers

For heat exchangers directly or indirectly connected to the safety-related service water system, the inspectors verified that the licensee: (1) used an industry-accepted test method and established test conditions appropriate for that test method; (2) ensured test acceptance criteria were consistent with design basis values and that the licensee appropriately considered the differences between design and test conditions; (3) accounted for instrument inaccuracies in the test results; (4) conducted heat exchanger testing at an appropriate frequency; and (5) established an appropriate cleaning and inspection frequency.

In addition, for heat exchanger directly or indirectly connected to the safety-related service water system, the inspectors verified and evaluated that the licensee appropriately: (1) established tube plugging limits and had sufficient margin for operating the heat exchangers within the plugging limits; (2) evaluated the potential for water hammer, as applicable; (3) conducted periodic flow testing to ensure that heat exchangers would receive the required design flows; (4) recorded, evaluated, and dispositioned as-found conditions, and (5) conducted eddy current testing.

In addition, specifically for heat exchangers directly connected to the safety-related service water system, the inspectors evaluated whether the licensee established an appropriate biotic fouling monitoring program provided sufficient controls to ensure proper heat transfer. For heat exchangers not directly connected to the safety-related service water system, the inspectors evaluated whether the licensee conducted their chemical control programs in accordance with an industry accepted program.

For the ultimate heat sink and its subcomponents, the inspectors verified whether the licensee appropriately: (1) established controls for macrofouling and biological fouling; (2) monitored, trended, and maintained silting/sediment intrusion at the intake structure; (3) developed plans to implement a biocide/corrosion treatment program to address

silting; (4) conducted inservice testing of motor-operated valves and pumps in the safety-related service water and reactor equipment cooling systems; (5) upgraded their cathodic protection system to protect the buried fire protection, service water, and diesel fuel oil piping; and (6) monitored for adverse makeup trends to the reactor equipment cooling surge tank.

Documents reviewed by the inspectors are listed in the attachment.

These activities constitute completion of three samples as defined in Inspection Procedure 71111-07-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Quarterly Review of Licensed Operator Requalification Program

a. Inspection Scope

On May 23, 2012, the inspectors observed a crew of licensed operators in the plant's simulator during requalification training. The inspectors assessed the following areas:

- Licensed operator performance
- The ability of the licensee to administer the evaluations and the quality of the training provided
- The modeling and performance of the control room simulator
- The quality of post-scenario critiques
- Follow-up actions taken by the licensee for identified discrepancies

These activities constitute completion of one quarterly licensed-operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Quarterly Observation of Licensed Operator Performance

a. Inspection Scope

On May 12, 2012, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was

in a period of heightened risk due to a quarterly downpower. The inspectors observed the operators' performance of the following activities:

- Plant power maneuver and rod pattern adjustment

In addition, the inspectors assessed the operators' adherence to plant procedures, including the conduct of operations procedure and other operations department policies.

These activities constitute completion of one quarterly licensed-operator performance sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- May 25, 2012, Reactor equipment cooling
- May 31, 2012, SW-V-1281 and 1282
- June 18, 2012, Diesel generator 1 left air distributor gasket replacement October 2011

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)

- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

Introduction. The inspectors documented a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the failure to develop and specify adequate postmaintenance testing requirements in work instructions used to perform maintenance on emergency diesel generator 1.

Description. On April 11 and April 12, 2012, diesel generator 1 failed to start during restoration from an online maintenance outage. During subsequent troubleshooting the licensee identified that the left bank air distributor rotor was 180 degrees out of alignment. The licensee corrected the distributors alignment issue and initiated Condition Reports CR-CNS-2012-02532 and CR-CNS-2012-02566 to capture these issues in the station's corrective action program.

The licensee performed a root cause evaluation and documented it in Condition Report CR-CNS-2012-02566. During their evaluation, the licensee determined that the distributor rotor had been misaligned during an online maintenance activity performed in October 2011 to replace a gasket on the air distributor. During this maintenance activity, the scope of the work had changed, but the required post maintenance testing was not revised to reflect the added work scope. This resulted in the distributor rotor being rotated 180 degrees when more components were removed and the specified testing, reassembly by precision measurement and match marks, was no longer adequate to ensure the rotor was in the correct position.

As such, the licensee determined that the root cause of this issue was that procedural guidance for ensuring post maintenance testing was inadequate to ensure the distributor was properly reinstalled after the work scope changed.

Inspectors reviewed the licensee's cause analysis and determined that the identified root cause was reasonable.

Analysis. The licensee's failure to establish adequate work instructions, to include postmaintenance testing requirements to verify equipment operability following maintenance, was a performance deficiency. The performance deficiency was more than minor because it affected the procedure quality attribute of the Mitigating Systems Cornerstone, and directly affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding screened as potentially risk significant since the finding represented an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time. When evaluated per Inspection Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and the Cooper Phase 2 pre-solved table item, "EDG1," the inspectors determined this finding to be of very low safety significance (Green). This finding had a cross-cutting aspect in the area of human performance associated with the resources component because the licensee failed to provide complete, accurate and up-to-date work packages that specified the appropriate post maintenance testing requirements following work scope change [H.2(c)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, in October 2011, the licensee failed to ensure that an activity affecting quality was appropriately prescribed by documented instructions appropriate to the circumstances. Specifically, Work Order 4766672 did not include adequate postmaintenance testing to demonstrate that diesel generator 1 remained operable following maintenance. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program as Condition Reports CR-CNS-2012-02532 and CR-CNS-2012-02566, this violation is being treated as an non-cited violation consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000298/2012003-01, "Failure to Perform Adequate Postmaintenance Testing."

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- April 27, 2012, Diesel generator 1 limiting condition for operation window protected equipment
- May 3, 2012, High pressure coolant injection limiting condition for operation maintenance window

- May 4, 2012, HPCI-V-44, anti-rotation device temporary configuration change and repair

- May 19, 2012, Inverter 1A uninterrupted power supply and transfer switch troubleshooting, 250 Vdc Bus 1A ground and acrid odor

- June 21, 2012, Zurn strainer A coupling failure

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

Introduction. The inspectors documented a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the failure to ensure compliance with the requirements of Station Procedure 7.0.1.7, Revision 15, "Troubleshooting Plant Equipment."

Description. On April 4, 2012, the licensee was troubleshooting no breaker power panel static inverter 1A per Work Order 4863518, "Troubleshooting SS-IVTR-UPS2 and Transfer Switch." The troubleshooting plan required that test equipment was able to be isolated from ground to generator power signal for the no breaker power panel static inverter 1A which is part of the ungrounded 250 Vdc Bus 1A system. After closing the normal DC input to the inverter per the troubleshooting instructions, the licensee received a ground alarm and noted a 0.8 volt drop on the 250 Vdc Bus 1A. A building operator reported an acrid odor locally at the no breaker power panel static inverter, specifically from the test equipment. The control room instructed the building operator to secure the no breaker power panel static inverter. After the normal DC input to inverter was opened, the ground cleared and the voltage returned to normal on the 250 Vdc Bus 1A and the acrid odor was no longer present. The licensee initiated Condition Report CR-CNS-2012-02717 to capture this concern in the corrective action program and conducted an evaluation.

The licensee determined during their evaluation that the installation of grounded test equipment in the ungrounded 250 Vdc Bus 1A system was the cause of the acrid odor detected locally, the ground, and the 0.8 volt drop on the 250 Vdc Bus 1A. The licensee determined that contrary to the troubleshooting plan, maintenance personnel had failed to ensure that ground isolated test equipment was used for the troubleshooting activity. Specifically, maintenance personnel assumed that the test equipment used was isolated, but failed to verify this assumption. However, the licensee noted that the vendor manual identified this equipment as grounded.

Analysis. The failure to follow the troubleshooting plan was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Specifically, the licensee failed to ensure that ground isolated test equipment was used as specified in troubleshooting plan contained in Work Order 4863518 causing a ground and 0.8 volt drop on the 250 Vdc Bus 1A. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions and conduct effectiveness reviews to validate the underlying assumptions that ground isolated test equipment was used as specified in the troubleshooting plan [H.1(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, "that activities affecting quality shall be prescribed by documented instructions or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions or drawings." Contrary to the above, on April 4, 2012, the licensee failed to ensure that an activity affecting quality was accomplished in accordance with documented instructions. Specifically, the licensee failed to ensure compliance with the requirements of Station Procedure 7.0.1.7, when grounded test equipment was used as during troubleshooting which caused a ground and 0.8 volt drop on the 250Vdc Bus 1A. The licensee entered the issue into the corrective action program as Condition Report CR-CNS-2012-02717. Because the violation was of very low safety significance (Green) and it was entered into the licensee's corrective action program, the violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy:
NCV 05000298/2012003-02, "Failure to Ensure Compliance with the Requirements of Station Troubleshooting Procedure."

1R15 Operability Evaluations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed the following assessments:

- April 2, 2012, Diesel generator number 1 jacket water heater hold down bolts
- April 20, 2012, Residual heat removal service water booster pump A, differential pressure in alert range
- April 26, 2012, Hand and foot monitor residual heat removal service water booster pump and BLDG-DOOR-R101 and R102
- May 2, 2012, Oil leak on the D service water booster pump outboard bearing
- May 24, 2012, Diesel generator 1 jacket water leak of three drops per second with comp measures and diesel generator jacket water pump net positive suction head
- May 31, 2012, Reactor building sump and diesel generator sumps, northeast quad

The inspectors selected these operability and functionality assessments based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure technical specification operability was properly justified and to verify the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and Updated Final Safety Analysis Report to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six operability evaluations inspection samples as defined in Inspection Procedure 71111.15-05.

b. Findings

(1) Failure to Recognize the Need for An Evaluation and to Properly Document the Bases for Operability

Introduction. The inspectors identified two examples of a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the failure to recognize the need for an evaluation and to properly document the bases for operability when a degrading nonconforming condition was identified.

Description. During a system walkdown of Diesel Generator 1 the licensee discovered that two of the four mounting bolts for the jacket water heater were loose. Station personnel immediately tightened the loose mounting bolts and verified that Diesel Generator 2 jacket water heater mounting bolts were tight. Station personnel initiated Condition Report CR-CNS-2012-02272 to capture this concern in the corrective action program and assess prior operability. The inspectors reviewed this operability assessment and identified that the licensee had used two different material types for the bolts during the operability analysis. Specifically, for shear in the vertical plane the licensee used 3/8 inch grade three A36 structural steel bolts and for tension in the horizontal plane the licensee used 3/8 inch grade two carbon steelproof of loading data. The inspectors questioned the use of two different material types and notified the licensee of their concern with the two different types of material used for the 3/8 inch bolts in the jacket water heater operability analysis. Specifically, the licensee had performed an evaluation without knowing the material used to manufacture the bolts. The station initiated Condition Report CR-CNS-2012-03137 to capture the concern in the corrective action program.

During subsequent reviews it was determine that the bolts were 3/8 inch R B&W Corporation grade five bolts for the jacket water heater mounting bolts. Once the bolt type and material were identified, the licensee reperformed their operability evaluation. The revised evaluation concluded there was sufficient strength for the shear in the vertical plane and tension in horizontal plane to ensure Diesel Generator 1 jacket water heater was operable during a safe shutdown earthquake with only two of the mounting bolts in place.

On April 19, 2012, during normal operator rounds the licensee discovered a free floating absorbent bag in Diesel Generator 2 room sump. The bag could have an adverse affect on the sump pump's float. The absorbent bag was removed and Diesel Generator 1 room sump was checked to verify no absorbent bag was present. The station initiated Condition Report CR-CNS-2012-02752 to capture this concern in the corrective action program. The inspectors reviewed Condition Report CR-CNS-2012-02752 and noted that an operability evaluation had not been performed for room sump. The licensee's justification for not conducting an operability was that the sumps: (1) were non essential and are not required by the technical specifications or technical requirements manual, and; (2) from their review of station calculation NEDC 11-150, Revision 0, "Evaluation of Maintenance Impacts on Internal Flood Analysis (Power Block)," the licensee determined that the limiting break was in Diesel Generator 2 room and that the high level alarm in sump was assumed to fail and flooding would spread to Diesel Generator 1 room under door N104. Therefore, even if the absorbent bag caused a failure of the diesel generator sump pumps or the high level alarm, there would be no adverse effect on the flooding calculation.

The inspectors reviewed the station's design calculation, NEDC 09-102, Revision 0, "Internal Flooding–HELB, MELB, and Feedwater Line Break," where the high level alarm for Diesel Generator 1 and 2 room sumps were credited for mitigation in the internal flooding analysis for a medium energy line break the diesel generator rooms. Inspectors

noted that: (1) the calculation assumed that the internal flooding event could occur in either diesel generator rooms, and analyzing the break using Diesel Generator 2 room volume was more conservative since the room was smaller, and (2) upon receipt of the high level alarm in the diesel generator room sumps operators were required to take action within ten minutes to isolate the break and to maintain the diesel generator not affected by the line break operable. The licensee had also evaluated the failure of the high level alarm switch in the affected room and determined that as long as operators took action within ten minutes of receiving the high level alarm in the unaffected room the unaffected diesel would remain operable. The inspectors determined that the licensee had failed to recognize the potential operability impact posed by the absorbent bag. The inspectors notified the control room of the concern and the station initiated Condition Report CR-CNS-2012-02767 to capture the concern in the corrective action program.

The station conducted an operability evaluation and determined that the sump floats consist of a metal rod connecting a float in the sump with the level switches above and the sump high level alarm would not be impeded by the absorbent bag.

Analysis. The licensee's failure to recognize the need for an evaluation and to properly document the bases for operability when a degraded nonconforming condition was identified were performance deficiencies. The performance deficiencies were determined to be more than minor because they were associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and are therefore two examples of a finding. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions and conduct effectiveness reviews to validate the underlying assumptions when determining Diesel Generator 1 jacket water heater seismic operability with only two bolts fully engaged and impact of a free floating absorbent bag in Diesel Generator 2 room sump for internal flooding analysis for a medium energy line break [H.1(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, "that activities affecting quality shall be prescribed by documented instructions or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions or drawings." Procedure 0.5.OPS, "Operations Review of Condition Reports/Operability Determination," requires that the shift manage document the basis for operability when a degraded nonconforming condition exists. Contrary to the above, on April 1, 2012, and

April 19, 2012, the licensee failed to ensure that an activity affecting quality was accomplished in accordance with documented instructions. Specifically, the licensee failed to recognize the need for an evaluation and to properly document the bases for operability when a degrading nonconforming conditions were identified. In particular, the licensee did not consider all relevant information when assessing: (1) the Diesel Generator 1 jacket water heater seismic operability with only two bolts fully engaged, and; (2) the impact of a free floating absorbent bag discovered in the Diesel Generator 2 room sump for internal flooding analysis for a medium energy line break. Because the finding is of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Reports CR-CNS-2012-03137 and CR-CNS-2012-02767, this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000298/2012003-03, "Failure to Recognize the Need for An Evaluation and to Properly Document the Bases for Operability."

(2) Failure to Maintain Design Control of the Standby Liquid Control System and Sumps Credited in the Internal Flooding Analysis

Introduction. The inspectors identified two examples of a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with the failure to maintain design control of the standby liquid control system and sumps credited in the station's internal flooding analysis.

Description. The inspectors reviewed station calculation NEDC 12-015, "Standby Liquid Control Test Tank Seismic Evaluation," which was subsequently performed by the licensee in response to Information Notice 2012-01, "Seismic Considerations–Principally Issues Involving Tanks," which was issued to provide recent operating experience related to seismic concerns. Station calculation NEDC 12-015 used the standby liquid storage tank seismic analysis contained in Burns & Roe Book 35 page 51 as the basis to show operability of the standby liquid control system test tank when full following a seismic event. The inspectors identified that in this calculation the licensee had used 0.46g for the safe shutdown earthquake coefficient instead of the Updated Safety Analysis Report safe shutdown earthquake coefficient value of 0.66g.

On March 19, 2012, the inspector notified the licensee of the difference in seismic coefficients. The licensee could not immediately determine why they had used the standby liquid control system storage tank safe shutdown earthquake seismic coefficient of 0.46g and not 0.66g as stated in the Updated Safety Analysis Report. The licensee initiated Condition Report CR-CNS-2012-01918 to capture the issue in the station's corrective action program. The licensee initiated a review of standby liquid control system storage tank seismic analysis using the Updated Safety Analysis Report safe shutdown earthquake coefficients and determined that the number of anchor bolts required for the standby liquid control system storage tank would be eleven instead of four. The standby liquid control system was determined to be operable following a seismic event since the standby liquid control system storage tank has twelve anchor bolts with a safety margin reduction from seven to one anchor bolt.

While conducting a walkdown of the 859 feet elevation of the reactor building northeast quad, the inspectors identified a tethered oil absorbent bag contained within the sump credited in the station's internal flooding analysis. The inspectors questioned what affect these bags could have on the sumps since they were not discussed or analyzed in station calculation NEDC 09-102, "Internal Flooding–HELB, MELB, and Feedwater Line Break," Revision 0. The inspectors notified the control room of their concern with an oil absorbent bag contained in a sump credited in the internal flooding analysis. The licensee initiated Condition Report CR-CNS-2012-02414 to capture this concern in the corrective action program.

The station determined the absorbent bags contained within the sumps were not part of the internal flooding analysis and were an unapproved modification. On April 9, 2012, the licensee removed the absorbent sump bags from the control building basement, emergency condensate storage tank area, and Diesel Generator 1 and 2 sumps. Additionally, the station initiated Condition Reports CR-CNS-2012-02509 and CR-CNS-2012-02510 to remove absorbent bags from the remaining sumps and update preventive maintenance plans so that new absorbent bags would not be installed in the sumps.

Analysis. The licensee's failure to maintain design control of the standby liquid control system and sumps credited for the station's internal flooding analysis was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1–Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action component because: (1) the licensee failed to thoroughly evaluate concerns with seismic analysis of the standby liquid control system such that the resolution addresses causes and extent of conditions, as necessary, during the development of NEDC 12-015 and; (2) the licensee had the opportunity in 2010 and early 2012 during reviews of the internal flooding analysis to identify that oil absorbent bags contained in the sumps credited in the internal flooding analysis did not contain an analysis and were an unapproved modification [P.1(c)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that, "measures shall be established to assure that applicable regulatory requirements and the design bases, as defined in 10 CFR 50.2 and as specified in the license application, for those components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Contrary to the

above the licensee failed to ensure that the facilities design basis were correctly translated into specifications, drawings, procedures, and instructions. Specifically, (1) from initial construction until March 20, 2012, the licensee failed to maintain the design control of the standby liquid control system and; (2) from initial construction until April 19, 2012, the licensee failed to assure that sumps credited in the station's internal flooding analysis where maintained in accordance with their design basis. Because the finding is of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Reports CR-CNS-2012-01918, CR-CNS-2012-02414, CR-CNS-2012-02509, CR-CNS-2012-02519, CR-CNS-2012-02752, and CR-CNS-2012-02767, this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000298/2012003-04, "Failure to Maintain Design Control of the Standby Liquid Control System and Sumps Credited in the Internal Flooding Analysis."

(3) Failure to Furnish Evidence of an Activity Affecting Quality

Introduction. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVII, "Quality Assurance Records," associated with the failure to furnish evidence of an activity affecting quality associated with the emergency diesel generator jacket water cooling pumps.

Description. On May 7, 2012, the licensee generated an operability evaluation for a leak in the diesel generator 1 jacket water system. In this operability evaluation the licensee determined that the volume loss due to the leak would exceed system volume for the time required for the system to operate. As such, the licensee developed a compensatory strategy to address this issue where they would allow the jacket water systems level to lower to the low level alarm point and then implement an alternate fill strategy.

During the inspectors' review of this operability evaluation they noted that the licensee's alternate fill strategy required operators to obtain and connect hoses to the station's fire water system. When asked about the amount of time these actions would take, the licensee responded that up to an hour and a half could be required to implement these actions before filling could commence. Based on the time required to implement the alternate fill strategy from when the low level alarm would be received the inspectors questioned if the systems level could drop below the level required to maintain the required net positive suction head for the jacket water pump to ensure that the pump would not cavitate.

The inspectors informed the licensee of their concern and asked them what the required net positive suction head was for the diesel generator jacket water pump and if the level drop during the implementation of the alternate fill strategy could affect it. The licensee generated Condition Report CR-CNS-2012-03263 to capture this concern in the station's corrective action program.

During their review the licensee determined that they did not have documentation showing what the required net positive suction head was for the diesel generator jacket water pump, and the pump vendor did not have the required documentation either.

Based on this, the inspectors also questioned the basis for the jacket water systems low level alarm set point. Specifically, how did the licensee verify that the required net positive suction head for the jacket water pump was maintained at the current low level alarm set point. The licensee initiated Condition Report CR-CNS-2012-3305 to capture this issue into the station's corrective action program.

Through consultation with the pump's vendor and using engineering input, the licensee generated a bounding operability evaluation to establish required net positive suction head for the jacket water pump pending final resolution.

Analysis. The licensee's failure to furnish evidence that showed the required net positive suction head for the jacket water pump was maintained at the current low level alarm set point was a performance deficiency. The performance deficiency was determined to be more than minor because it affected the design control attribute of the Mitigating Systems Cornerstone, and it directly affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Using Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it was not a design or qualification issue confirmed not to result in a loss of operability or functionality; did not represent an actual loss of safety function of system or train; did not result in the loss of one or more trains of nontechnical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or a severe weather initiating event. This finding did not have a cross-cutting aspect because the most significant contributor of this finding did not reflect current licensee performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVII, "Quality Assurance Records," states, in part, that, "Sufficient records shall be maintained to furnish evidence of activities affecting quality." Contrary to the above, from the early 1970's until May 9, 2012, the licensee did not maintain sufficient records to furnish evidence of an activity affecting quality. Specifically, ensuring that the required net positive suction head of the diesel generator jacket water pump was maintained to prevent pump cavitation was an activity affecting quality, and in May 2012, the licensee was unable to furnish evidence of this activity. Because this finding is of very low safety significance and has been entered into the corrective action program as Condition Reports CR-CNS-2012-03262, and CR-CNS-2012-03305, this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000298/2012003-05, "Failure to Furnish Evidence of an Activity Affecting Quality."

(4) Design Changes Not Appropriately Approved by the Licensee

Introduction. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with the failure to ensure that design changes were subject to design control measures commensurate with those applied to the original design and were approved by the designated responsible organization.

Description. While reviewing documentation associated with the new reverse engineered service water pump C, the inspectors requested a copy of the design basis seismic analysis. The licensee subsequently provided vendor calculation E12.5.1925, "Seismic Qualification Analysis for 28KXL 1-Stage Vertical Pump," Revision 0, as the design seismic analysis for the pump. This analysis was prepared by the vendor to address changes introduced by the reverse engineered pump.

The inspectors reviewed this analysis and noted that this was a vendor supplied calculation being used as the station's design basis analysis. However, this calculation did not appear to have been reviewed and approved in accordance with station requirements. Specifically, station Procedure 3.11.1, "Control of Vendor Originated Documents and Correspondence," Revision 2, required that all vendor originated technical documents, such as calculations, to be used to support the design, functionality, or operability (such as design input or design output) of installed and operational plant systems, structures, or components are controlled by the requirements of station procedure 3.4.7, "Design Calculations." Procedure 3.4.7 requires, in part, that a review of design calculations prepared by consultants shall be performed per this procedure. Specifically, a reviewer shall review the design calculation to ensure the purpose, design inputs, assumptions, methodology, and conclusions, are correct and justified, and the engineering supervisor shall approve the reviewed calculation. Signatures from these two individuals signified acceptance of the vendor-supplied calculation.

Inspectors noted that while vendor calculation E12.5.1925 had been reviewed by an engineer, the review had not been documented in accordance with station Procedure 3.4.7. Inspectors also noted that this review had failed to recognize that the analysis had incorporated a material change from the previous design analysis and this change had not been reviewed. Inspectors also noted that the document had not been accepted by the engineer supervisor as required by station procedure. Therefore, the inspectors determined that the licensee had failed to ensure that this design change was subject to design control measures commensurate with those applied to the original design, and were approved by the designated responsible organization.

The inspectors informed the licensee of their concern. The licensee initiated Condition Report CR-CNS-2012-3634 to capture this issue in the station corrective action program. During their review the licensee determined that the vendor calculation had not been reviewed and accepted in accordance with station requirements. To correct this issue the licensee reviewed and accepted the vendor calculation in accordance with station procedure 3.4.7.

Analysis. The licensee's failure to ensure that design changes were subject to design control measures commensurate with those applied to the original design, and were approved by the designated responsible organization was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Using Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. This finding had a cross-cutting aspect in the area of human performance associated with the work practices component because the licensee failed to adequately define and effectively communicates expectations regarding procedural compliance and personnel failed to follow procedures. Specifically, engineering department personnel failed to follow station procedures when receiving a new design basis calculation from a vendor [H.4(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that, "Design changes shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design unless the applicant designates another responsible organization." Contrary to the above, on March 7, 2012, the licensee failed to ensure that design changes were subject to design control measures commensurate with those applied to the original design, and were approved by the designated responsible organization. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program as Condition Report CR-CNS-2012-03634, this violation is being treated as an non-cited violation consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000298/2012003-06, "Design Changes Not Appropriately Approved by the Licensee."

1R18 Plant Modifications (71111.18)

Permanent Modifications

a. Inspection Scope

The inspectors reviewed key parameters associated with energy needs, materials, replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flow paths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for the permanent modification identified as the D service water booster pump.

The inspectors verified that modification preparation, staging, and implementation did not impair emergency/abnormal operating procedure actions, key safety functions, or

operator response to loss of key safety functions; postmodification testing will maintain the plant in a safe configuration during testing by verifying that unintended system interactions will not occur; systems, structures and components' performance characteristics still meet the design basis; the modification design assumptions were appropriate; the modification test acceptance criteria will be met; and licensee personnel identified and implemented appropriate corrective actions associated with permanent plant modifications. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample for permanent plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

Introduction. The inspectors identified four examples of a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to follow the requirements of station Procedure 0.8, "10CFR50.59 and 10CFR72 .48 Reviews," and evaluate changes made to safety related components for adverse impacts.

Description. The first example was identified on April 19, 2012. While touring the plant inspectors noticed the licensee machining the suction flange for the D service water booster pump. Inspectors inquired about this activity and learned that during the installation of the new pump motor with the suction piping and pump connected, the pump hold down bolting did not align to the pump base. The Engineering Fix-It-Now team had reviewed this issue and noted that that per the construction contract's specifications, the piping was required to have 150# class raised face flanges. However, the as-built configuration of the suction piping elbow had consisted of 300# class weld neck raised face flanges on both ends. The Engineering Fix-It-Now team could not identify the reason why the 300# class flanges were installed on the suction side of the booster pump. As such, they determined that machining the flange face was acceptable as long as the flange retained sufficient thickness to be classified as a 150#, or greater, class flange after the machining was complete. Furthermore, they determined that this was an inconsequential change and would be categorized as an exempt activity in accordance with station Procedure 3.4, "Configuration Change Control," instead of implementing the requirements of station Procedure 0.8, "10CFR50.59 and 10CFR72.48 Reviews," and performing a 50.59 review to determine if the change was adverse.

The inspectors asked if the change had been evaluated for its potential effect on the systems seismic analysis since it had been classified as an exempt activity. The licensee determined that a seismic evaluation had not been performed and initiated Condition Report CR-CNS-2012-02750 to capture this issue in the corrective action program. During additional reviews, the licensee determined that NEDC 89-1302, the stations design basis seismic analysis, had analyzed the system with 300# class weld neck raised face flanges and changing these flanges could have an adverse impact on the systems seismic rating. Inspectors determined that the licensee had failed to follow the requirements of station Procedure 0.8 and determine if changes are adverse prior to implementation, when modifying safety related equipment.

Inspectors performed additional reviews of changes involving safety-related equipment to verify that the licensee was appropriately evaluating these changes. During their review inspectors identified three additional examples of changes that had not been appropriately reviewed using station Procedure 0.8.

1) The licensee had modified the mounting feet for the D reactor equipment cooling pump. This work had been authorized by engineering as an inconsequential change. Inspectors noted that a 10 CFR 50.59 screen had also been performed for enlarging the motor mounting holes but the 10 CFR 50.59 screen stated that the change was below the level of detail of the requirements of station Procedure 3.4 and screened out. The inspectors subsequently determined that this change had the potential to affect the seismic analysis for the pump and the licensee had failed to evaluate this in their screen. The licensee initiated Condition Report CR-CNS-2012-03806 to capture this issue in the corrective action program.

2) The licensee had modified the service water discharge piping on diesel generator number 1. This modification involved moving a flow restricting orifice, and had been authorized by engineering as an inconsequential change. Inspectors noted that this system has a design basis flow evaluation associated with it, and as such determined that this change should have been evaluated to determine if it was adverse prior to implementation. The licensee initiated Condition Report CR-CNS-2012-04033 to capture this issue in the corrective action program.

3) The licensee identified that a contractor had modified the discharge flange for the C service water pump, making the flange thicker. The licensee performed an equivalency evaluation for this change in accordance with station procedure 3-CNS-DC-138.1, "Part Evaluations," and classified the change as like-for-like. However, the inspectors determined that this was not a like-for-like change because the thicker flange could affect the seismic analysis, and as such should have been evaluated for potential adverse impacts. The licensee initiated Condition Report CR-CNS-2012-03066 to capture this issue in the corrective action program.

In each of these examples the inspectors determined that the licensee had failed to follow the requirements of station Procedure 0.8 and determine if changes are adverse prior to implementation, when modifying safety related equipment. The licensee subsequently initiated Condition Report CR-CNS-2012-04456 as a roll up for all of these issues.

Analysis. The failure of station personnel to follow the requirements of station procedure 0.8, "10CFR50.59 and 10CFR72 .48 Reviews," for modifications to safety related equipment was a performance deficiency. The performance deficiency was determined to be more than minor because if left uncorrected, the continued practice of modifying the facility without evaluating for adverse impacts has the potential to lead to a more significant safety concern. Specifically, unevaluated modifications to the facility could introduce adverse changes that result in systems not able to perform their intended safety function which would not be recognized, and therefore is a finding. This finding affects Mitigating Systems Cornerstone. Using Manual Chapter 0609, Attachment 4,

"Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of the system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; and (4) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding was determined to have a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate it is unsafe in order to disapprove the action [H.1(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, from October 2009 through June 2012, the licensee failed to ensure that activities affecting were accomplished in accordance with prescribed instructions. Specifically, four separate instances were identified where multiple work groups failed to follow the requirements of station Procedure 0.8, "10CFR50.59 and 10CFR72 .48 Reviews," and evaluate changes made to safety related components for adverse impacts. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program as Condition Reports CR-CNS-2012-02750, CR-CNS-2012-03366, CR-CNS-2012-03806, CR-CNS-2012-04033, and CR-CNS-2012-04456, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000298/2012003-07, "Failure to Evaluate Changes for Adverse Impacts."

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- May 2, 2012, Residual heat removal service water booster pump D replacement and residual heat removal service water booster pump B maintenance
- May 3, 2012, High pressure coolant injection limiting condition for operation post-maintenance test, HPCI-AOV-AO70 and 71, HPCI-V-44 damaged anti-rotation device
- May 12, 2012, Core spray B
- May 13, 2012, HV-AO-263 repair

- May 14, 2012, Residual heat removal limiting condition for operation maintenance

- June 13, 2012, Diesel generator 1 valve and gasket replacement

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed

- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the Updated Final Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six post-maintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning

- Evaluation of testing impact on the plant

- Acceptance criteria

- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- April 4, 2012, Service water booster pump A and C inservice tests
- April 30, 2012, High pressure coolant injection valve operation testing
- May 7, 2012, Core spray loop A pump time delay channel function test
- May 11, 2012, Reactor equipment cooling time delay relay testing and pump A and B operation
- June 18, 2012, Reactor coolant system leak detection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

(1) Non-conservative Service Water Booster Pump A and D Differential Pressure Operability Limits During In-Service Surveillance Testing

Introduction. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Controls," for the licensee's nonconservative service water booster pump A and D differential pressure operability limits.

Description. From July 19, 2011 to September 2, 2011, the licensee noted a downward trend of pump differential pressure for service water booster pumps A and D, and initiated the Condition Reports CR-CNS-2011-07980, CR-CNS-2011-09344, and CR-CNS-2011-09444 to capture this concern in the corrective action program. The licensee conducted an apparent cause evaluation and an operability evaluation and identified the following compensatory measures to ensure that service water booster pumps A and D can meet their 30 day mission time for a design basis accident:

1) install caution tags on service water booster pump A to minimize run time;

2) monitor run time of service water booster pump A to ensure 312 hours is not exceeded to ensure the pump meets its 30 day mission time;

3) monitor run time of service water booster pump D to ensure 504 hours is not exceeded to ensure the pump meets its 30 day mission time;

4) perform two year in-service testing during quarterly surveillance using calibrated pressure test gauges on service water pump A and D; and

5) schedule service water booster pump A and D for replacement in 2012.

On April 3, 2012, the licensee conducted in-service Procedure 6.1SWBP.101, Revision 20, "RHR Service Water Booster Pump Flow Test and Valve Operability Test (Div 1)". During the surveillance test the licensee determined that service water booster pump A differential pressure, with a value of 338.5 psid, entered the alert range as determined by ASME Code for Operation and Maintenance of Nuclear Power Plants. The alert range for service water pump A was 328.5 to 339.5 psid. The licensee initiated Condition Report CR-CNS-2012-02343 to capture the concern in the corrective action program and update, if needed, the operability evaluation and compensatory measures developed from the corrective actions contained within CR-CNS-2011-09444.

Inspectors reviewed the results of Surveillance Procedure 6.1SWBP.101, CR-CNS-2012-02343, and CR-CNS-2011-09444 and noted the operability limit for service water pump A and D for pump differential pressure developed from the ASME Code for Operation and Maintenance of Nuclear Power Plants was potentially nonconservative, because when the licensee established this limit it did not account for the 30 day mission time due to the degraded condition of the pumps. Specifically, the lower operability limit derived from the ASME methodology for service water booster pump A and D would not ensure that the pumps would meet their 30 day mission time

during a design basis accident, based on current rate of pump degradation, approximately 0.5 psid per day.

Specifically, the operability limit developed by the ASME code for in-service testing program requires the more limiting of either a +/- 10% limit on pump's base line performance value or a calculated operability value to ensure the safety function is maintained. However, Inspection Manual Technical Guidance Part 9900, "Operability Determinations and Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety," provides the following guidance when it is acceptable to use alert range developed by ASME Code for Operation and Maintenance of Nuclear Power Plants instead of technical specification operability:

> "The technical specifications normally apply to the overall performance of plant systems, but sometimes contain limiting values for the performance of certain components. The limiting values are specified to ensure that the design basis and safety analysis are satisfied. The values (e.g., pump flow rate, valve closure time, valve leakage rate, safety/relief valve set point pressure) are criteria that can be used to verify operability. If the values are not met at any time, the system must be declared inoperable, the limited condition for operations must be declared not met, and the applicable conditions must be entered.
>
> The ASME Operation and Maintenance of Nuclear Power Plants Code establishes the requirements for pre-service and in-service testing and the examination of certain components to assess their operational readiness. ASME Operation and Maintenance of Nuclear Power Plants Code acceptance criteria for in-service testing include, "required action ranges" or limiting values for certain component performance parameters. These required action ranges or limiting values, defined by the ASME Operation and Maintenance of Nuclear Power Plants Code as component performance parameters, may be more limiting than the technical specification values (which are accident analysis limits). Position 8 in Attachment 1 to Generic Letter 89-04, "Guidance on Developing Acceptable In-service Testing Programs," defines the starting point for the completion time in technical specifications actions for ASME pump and valve testing. When performance data fall outside the required action range, regardless of whether the limit is equal to the technical specifications limit or more restrictive, the pump or valve must be declared inoperable immediately (the word "inoperative" is used in the text of the ASME Code, i.e., the pump or valve is both "inoperative" and inoperable) and the limited condition of operation must be declared not met and the applicable conditions must be entered. When the required action range is more limiting than its corresponding technical specification, the corrective action need not be limited to replacement or repair; it could be an analysis to demonstrate that the specific performance degradation does not impair operability and that the pump or valve will still fulfill its function, such as delivering the required flow. A new required action range may be established after such analysis, allowing a new operability determination."

The inspectors informed the licensee of their concerns regarding the operability limit for service water booster pumps A and D, and the licensee initiated Condition

Reports CR-CNS-2012-02500 and CR-CNS-2012-02497 to capture this concern in the corrective action program. The licensee subsequently performed a review of the operability evaluation contained in Condition Report CR-CNS-2011-09444 and revised the operability lower limit to ensure service water booster pump A and D would meet their 30 day mission time for a design basis accident for the current degrading condition, and the current pump differential pressure observed did not exceed this operability lower limit for pumps A and D.

Analysis. The licensee's nonconservative service water booster pump A and D differential pressure operability limits was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the procedural quality attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Specifically, the pump differential pressure operability limit for service water booster pump A and D was not correctly stated in the In-service Testing program so that the pumps would meet their 30 day mission time for a design basis accident with a degrading pump differential pressure. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action component because the licensee failed to thoroughly evaluate concerns with operability limit for service water booster pump A and D such that the resolution address causes an extent of conditions, as necessary. Specifically, operability lower limit was identified during the initiation of Condition Report CR-CNS-2011-07980, but the licensee failed to update the operability limits during the review of the condition report [P.1(c)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," states in part, that, "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents." Contrary to the above, from July 19, 2011 to April 19, 2012, the licensee failed to ensure that required testing for demonstrating that structures, systems, and components will perform satisfactorily in service incorporated the appropriate acceptance limits. Specifically, the licensee did not include operability limits that were based on a 30 day mission for a design basis accident for the degraded performance of service water booster pumps A and D. The licensee entered the issue into the corrective action program as Condition Report CR-CNS-2012-02497 and CR-CNS-2012-02500. Because the violation was of very low safety significance (Green) and it was entered into the licensee's corrective action program, the violation is

being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000298/2012003-08, "Non-conservative Service Water Booster Pump A and D Differential Pressure Operability Limits During In-Service Surveillance Testing."

(2) Failure to Follow Radiation Work Permit Requirements

Introduction. The inspectors identified a Green non-cited violation of Technical Specification 5.4.1, associated with station personnel's failure to follow radiation work permit requirements.

Description. On April 18, 2012, inspectors were observing craft personnel perform Surveillance Procedure 6.2RPS.708, "North SDV High Water Level Switches and Transmitters Channel Functional Test (Div. 2)," Revision 8, with the workers signed onto Radiation Work Permit 2012-073, "RX Building Activities in High Rad Areas," task 4, for the job. During their observation the inspectors noted that craft personnel breached the scram discharge volume system to connect their test instruments without radiation protection personnel present while this was occurring. The inspectors questioned this action because Surveillance Procedure 6.2RPS.708, step 2.2, identified that the system fluid was contaminated and Radiation Work Permit 2012-073 required that radiation protection personnel be present when breaching contaminated systems. When the inspectors asked the workers if it was required for a radiation protection personnel to be present for the breaching activity, the workers replied that it was not because they were working in a posted contamination area. The inspectors determined that this was not correct and as such, the workers had failed to follow the requirements of Radiation Work Permit 2012-073. The inspectors informed the Radiation Protection Manager of this issue and Condition Report CR-CNS-2012-02716 was written to capture this issue in the station's corrective action program.

Analysis. The inspectors determined that the failure of craft personnel to follow radiation work permit requirements when breaching contaminated systems was a performance deficiency. The performance deficiency was determined to be more than minor because if left uncorrected, the continued failure of craft personnel to follow radiation work permit requirements when breaching contaminated systems could become more significant, in that, it could lead to personnel contamination events and unplanned/unexpected dose, and is therefore a finding. The finding was associated with the Occupational Radiation Safety Cornerstone. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspector determined the finding to be of very low safety significance because: (1) it was not associated with as low as reasonably achievable (ALARA) planning or work controls; (2) there was no overexposure; (3) there was no substantial potential for an overexposure and; (4) the ability to assess dose was not compromised. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision-making component because workers failed to use conservative assumptions in decision making when breaching a contaminated system for maintenance [H.1(b)].

Enforcement. Technical Specification 5.4.1.a requires implementation of applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Section 7(e) of Appendix A requires, in part, procedures for access control to radiation areas including a radiation work permit system should be prepared. Procedure 9.ALARA.4, "Radiation Work Permit," Revision 15, implements this requirement and states, in part, that each individual is responsible to comply with the radiation work permit requirements. Radiation Work Permits 2012-013, "Instrument and Control Activities," and 2012-073, "RX Building Activities in High Rad Areas," requires that radiation protection personnel to be present prior to breaching contaminated systems. Contrary to the above, on April 18, 2012, craft personnel failed to comply with radiation work permit requirements when a contaminated system was breached without radiation protection personnel present. Because the finding is of very low safety significance and has been entered into the corrective action program as Condition Report CR-CNS-2012-02716, the violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000298/2011004-09, "Failure to Follow Radiation Work Permit Requirements."

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

This area was inspected to assess performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel and reviewed the following items:

- Site-specific ALARA procedures and collective exposure history, including the current 3-year rolling average, site-specific trends in collective exposures, and source-term measurements
- ALARA work activity evaluations/postjob reviews, exposure estimates, and exposure mitigation requirements
- The methodology for estimating work activity exposures, the intended dose outcome, the accuracy of dose rate and man-hour estimates, and intended versus actual work activity doses and the reasons for any inconsistencies
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry

- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas

- Audits, self-assessments, and corrective action documents related to ALARA planning and controls since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample as defined in Inspection Procedure 71124.02-05.

b. Findings

(1) Failure to Perform a Radiation and Contamination Survey

Introduction. The inspectors reviewed a Green self-revealing non-cited violation of 10 CFR 20.1501(a) for the failure to perform adequate radiation and contamination surveys. Specifically, a survey was not performed prior to power washing the reactor vessel studs during reactor cavity decontamination work as part of Refueling Outage 26. The absence of a survey resulted in an unanticipated airborne radioactivity area, and unintended, unplanned dose to five workers.

Description. On April 21, 2011, reactor cavity decontamination was in process using Radiological Work Permit 2011-438, Task 5. This work was completed using a cavity decontamination plan instead of a specific procedure. Consequently, the plan was treated as guidance rather than a procedure. The plan did not include contingency actions, operating experience, verification of the reactor building ventilation status or any instructions for power washing the reactor vessel head studs. However, the decision was made by the radiation protection manager and cavity decontamination supervisor to power wash the reactor vessel studs. Contamination survey data that was available during the cavity and reactor decontamination timeframe noted that contamination was in excess of 100–150 mrad/hour, routinely. However, a survey was not performed to evaluate the contamination levels on the studs prior to washing. At approximately 1:20 p.m., the cavity decontamination supervisor began power washing the studs and at approximately 1:30 p.m. a continuous air monitor alarmed on the refueling floor. Containment was evacuated and a subsequent review of the air sample data revealed that power washing the studs created an airborne radioactivity area. Five individuals working on the refueling floor received internal uptakes resulting in doses ranging from 1.44 mrem to 9.1 mrem as a result of the airborne radioactivity area created by power washing the reactor vessel studs.

Analysis. The failure to perform a survey to evaluate the radiological conditions is a performance deficiency. The finding is more than minor because it negatively impacted the Occupational Radiation Safety Cornerstone attribute of Program and Process, in that, the lack of a survey did not ensure exposure control for workers. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance because: (1) it was not associated with ALARA planning or work controls; (2) there was

no overexposure; (3) there was no substantial potential for an overexposure; and (4) the ability to assess dose was not compromised. This finding has a cross-cutting aspect in the area of human performance associated with the decision-making component because the radiation protection manager and cavity decontamination supervisor did not fully use radiological job plans and controls. Specifically, the radiation protection manager and cavity decontamination supervisor made the decision to power wash the vessel studs without using a written work plan [H.1.a].

Enforcement. As required in 10 CFR 20.1501(a), each licensee shall make or cause to be made surveys that may be necessary for the licensee to comply with the regulations in 10 CFR Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present. Contrary to the above, on April 21, 2011, radiation protection personnel did not perform a radiation survey of the reactor vessel head studs in order to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials and potential radiological hazards present. Consequently, power washing the contaminated studs created an airborne radioactivity area and caused five individuals to receive unplanned, unintended internal dose. Since this violation was of very low safety significance and was documented in Condition Report CR-CNS-2011-04891, it is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy:
NCV 05000298/2012003-10, "Failure to Perform a Radiation and Contamination Survey."

(2) ALARA Program Failed to Prevent Unintended Doses for Refueling Floor Activities, Outage RE26

Introduction. Inspectors identified a Green finding of very low safety significance because during Refueling Outage 26 the licensee failed to follow ALARA planning and control procedures to maintain doses ALARA for refueling floor activities covered under Radiological Work Package 2011-05.

Description. While reviewing Radiological Work Package 2011-05 from Refueling Outage 26, inspectors identified that the licensee's ALARA planning and control program failed to prevent unplanned and unintended collectives doses. Specifically, the original refueling floor work activities' collective dose planned estimate was 25 person-rem and the actual accumulated collective dose was 45 person-rem. This represented an overage of 20 person-rem and exceeded the estimated dose by 80 percent. The licensee concluded during the inspection that this overage was unintended and unjustified collective dose.

The licensee organizes radiological work into radiological work packages. These packages often consist of multiple radiation work permits with multiple tasks to help control collective doses from an ALARA planning and work control perspective. Multiple work groups are responsible for planning the different aspects of the work packages. Specifically, the group planning a specific radiological work permit is not necessarily part of the group planning the radiological work package that includes the permit. Inspection Manual Chapter 0609, Appendix C, Section III(D) defines "work activity" as one or more closely related tasks that the licensee has grouped together as a unit of work for the

purpose of ALARA planning and work controls. Therefore, the inspectors reviewed the radiological work package as a whole, but also reviewed the individual radiation work permits.

The refueling floor work activities in Radiological Work Package 2011-05 consisted of four primary operations, each with its own radiological work permit: reactor disassemble/reassemble, cell maintenance/fuel moves, low power range monitor replacements, and refuel floor support activities. A primary contributor to the unintended collective dose of Radiological Work Package 2011-05 was the reactor disassemble/reassemble work, which had an original collective dose estimated at 14 person-rem, but had an actual collective dose of 24 person-rem. This represented a collective dose overage of 10 person-rem. The licensee determined that 8.65 of the 10 person-rem overage was of expanded work scope associated with increased reactor reassembly work. This increase in work scope was not fully understood nor justified in the ALARA package, and it resulted in unintended collective dose.

Some causes for the dose overages associated with Radiological Work Package 2011-05 were higher doses rates than expected, longer work durations than expected, and more added work scope than expected. However, there was no evidence in the licensee's ALARA package documentation, such as revision packages and ALARA committee meeting minutes, that showed planning was completed to take compensatory measures and justify the dose estimate increases resulting from changes in the job scope, duration and work area dose rates. The inspectors determined that the performance deficiency that led to the unplanned increased collective dose was not following the ALARA planning and work control procedure which talks about justifying dose estimate increases. Specifically, Procedure 9.ALARA.5, "ALARA Planning and Controls," Revision 21, states the following:

- Step 3.11: When the job is started, ALARA or Radiation Protection will review the initial work area surveys to validate dose rate and exposure assumptions used during package development. If during the review of the original surveys it is determined that radiological conditions were not as anticipated, the package should be evaluated for possible revision.

- Step 6.7.3: The revision should be documented on Calculation of Person-Rem Worksheet, CNS RP-38, and include the justification for the revision. Complete the Radiological Job Package Revision Form (RP-32) and include in the package, documenting the ALARA Committee approval date.

The licensee did not document dose-estimate increases in accordance with the procedure because it contains permissive language on key instructions. For example, since the procedure contains "should" statements instead of "shall" statements it does not provide any strict requirements for the type of evaluation necessary to provide justification for a revision. Therefore, this issue is being treated as a finding. This finding and procedure concerns were documented in the licensee's corrective action program as Condition Reports CR-CNS-2012-02551 and CR-CNS-2012-02652.

Analysis. The failure to follow the ALARA planning and controls procedure to prevent unplanned and unintended collective doses was a performance deficiency. This finding is greater than minor because it affected the Occupational Radiation Safety Cornerstone attribute of Program and Process, in that, failure to implement ALARA procedures adequately caused increased collective radiation dose for the job activity to exceed 5 person-rem and exceeded the planned dose by more than 50 percent. In addition, this type of issue is addressed in Example 6.j of Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues." Using the Occupational Radiation Safety Significance Determination Process, the inspectors determined that this finding was of very low safety significance because it involved ALARA planning and controls and the licensee's latest rolling three-year average does not exceed 240 person-rem. This finding has a cross-cutting aspect in the area of human performance associated with the work control component because the licensee failed to evaluate the impact of work scope changes on human performance and interdepartmental communication and coordination prior to commencing work activities. Specifically, work groups, Health Physics, and the ALARA Planners did not effectively communicate how work scope changes of the radiation work permits would affect the dose estimate of the radiological work package [H.3.b].

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. This finding is documented in the licensee's corrective action program by Condition Report CR-CNS-2012-02652.
FIN 05000298/2012003-11, "ALARA Program Failed to Prevent Unintended Doses for Refueling Floor Activities, Outage RE26."

2RS4 Occupational Dose Assessment (71124.04)

a. Inspection Scope

This area was inspected to: (1) determine the accuracy and operability of personal monitoring equipment; (2) determine the accuracy and effectiveness of the licensee's methods for determining total effective dose equivalent; and (3) ensure occupational dose is appropriately monitored. The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel, performed walkdowns of various portions of the plant, and reviewed the following items:

- External dosimetry accreditation, storage, issue, use, and processing of active and passive dosimeters
- The technical competency and adequacy of the licensee's internal dosimetry program
- Adequacy of the dosimetry program for special dosimetry situations such as declared pregnant workers, multiple dosimetry placement, and neutron dose assessment

- Audits, self-assessments, and corrective action documents related to dose assessment since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample as defined in Inspection Procedure 71124.04-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures performance indicator for the period from the third quarter 2011 through the second quarter 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports, and NRC integrated inspection reports for the period of July 2011 through June 2012, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one safety system functional failures sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.2 Reactor Coolant System Specific Activity (BI01)

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system specific activity performance indicator for the period from the third quarter 2011 through the second quarter 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 9-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's reactor coolant system chemistry samples, technical specification requirements, issue reports, event reports, and NRC integrated inspection reports for the period of July 2011 through June 2012, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one reactor coolant system specific activity sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Reactor Coolant System Leakage (BI02)

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system leakage performance indicator for the period from the third quarter 2011 through the second quarter 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator logs, reactor coolant system leakage tracking data, issue reports, event reports, and NRC integrated inspection reports for the period of July 2011 through June 2012, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one reactor coolant system leakage sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

Introduction. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with the failure to ensure that the control building's essential ventilation system would maintain battery room temperatures such that the batteries would remain operable under all design conditions.

Description. CR-CNS-2011-12345 was initiated on December 21, 2011, to identify that Battery Room 1A temperature was low, less than 76 degrees, due to extended operation of the control building essential ventilation system during winter months, and this had required the use of portable heaters per station procedure 2.2.38.2, "Portable Heating System." This condition report was classified as a fix level issue and was assigned for corrective action review board review.

The licensee evaluated this issue and presented the evaluation to the corrective action review board, which approved it, on January 31, 2011. In this evaluation the licensee determined that the activation of the safety-related control building essential ventilation system causes the non-essential ventilation supply dampers to isolate, preventing the stations non-essential steam heating system from maintaining control building temperatures, and this affects battery room temperatures since they then become dependent on the bulk control building temperatures. As such, with the control building essential ventilation system running, battery room temperatures would continue to lower and at 76 degrees operators would need to install portable heaters as directed by station procedure 2.2.38.2, "Portable Heating System," to maintain the batteries operable. The inspectors considered this action to be appropriate.

During the corrective action review board review inspectors questioned the adequacy of the control building essential ventilation systems design. Specifically, inspectors noted that if the facilities design basis, low temperature for outside air (-5 degrees), and the longest period of time (30 days) that the control building essential ventilation system could be required to be in service were to occur at the same time then compensatory measures (portable heaters) were required to ensure operability of the station batteries under the design conditions. The licensee initiated Condition Report CR-CNS-201200724 to capture this issue in the stations corrective action program.

Subsequent review determined that due to concerns with the adequacy of ventilation in the switchgear, battery and diesel generator rooms the original plant design of the control building ventilation system had been found to be inadequate during an NRC inspection in 1987. In response to these concerns the licensee developed station procedure 2.2.38.2 to deploy portable heaters to maintain battery room temperatures above 70 degrees to support battery operability. To address the NRC concerns the licensee installed an essential control building HVAC system for cooling the critical AC and DC electrical equipment rooms, which was completed in 1990. This design change included temperature controlled automatic dampers in the HVAC supply to the battery rooms that close on a lowering temperature to limit battery room cool down, but did not include heating units to maintain room temperature during cold weather operation.

The licensee performed an operability evaluation associated with this concern and determined that the station batteries are operable with compensatory measure.

Analysis. The licensee's failure to ensure that the essential ventilation system would support battery operability under all design conditions was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Using Manual Chapter 0609, Attachment 4, "Phase 1 Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or server weather initiating event. This finding had a cross-cutting aspect in the area of human performance associated with the decision-making component because the licensee failed to conduct adequate effectiveness reviews of safety-significant decisions to verify the validity of the underlying assumptions, and identify possible unintended consequences. Specifically, the licensee failed to recognize the use of portable heaters as a manual action which indicated an inadequate ventilation design [H.1(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, Design Control, states, in part, that "measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2 and as specific in the license application, for those components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Contrary to the above, from June 1987 until January 31, 2012, the licnesee failed to ensure that the facilities design basis was correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee failed to maintain design control of the control building essential ventilation system. Consequently, the essential ventilation system would not support battery operability under all design conditions. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program as Condition Report CR-CNS-2012-00724, this violation is being treated as an noncited violation consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000298/2012003-12, "Failure to Maintain Design Control of the Essential Ventilation System."

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human

performance results. The inspectors nominally considered the 6-month period of January 2012 through June 2012 although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute completion of one single semi-annual trend inspection sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings of significance were identified. The inspectors evaluated the licensee's trending methodology and observed that the licensee had performed a detailed review. The licensee routinely reviewed cause codes, involved organizations, key words, and system links to identify potential trends in their corrective action program data. The inspectors compared the licensee process results with the results of the inspectors' daily screening and did not identify any discrepancies or potential trends in the corrective action program data that the licensee had failed to identify. The inspectors did, however, identify additional insights into several of these issues as documented below:

Substantive Cross-Cutting Issues Trend Review

(1) Cross-cutting Theme in Problem Evaluation P.1(c)

In the 2011 mid-cycle assessment letter, dated September 1, 2011, the NRC staff identified that a cross-cutting theme existed in the corrective action program component of the problem identification and resolution area [P.1(c)]. At the time, the NRC did not identify a substantive cross-cutting issue due to the licensee's scope of effort in addressing the theme, and it being an emergent performance trend. The licensee acknowledged this theme and initiated CR-CNS-2011-08284 ("NRC Findings with a CCA of P.1(c)") on July 28, 2011. The investigation performed by CR-CNS-2011-08284 concluded that licensee's failure to use internal operating experience to review recurring legacy problems was the common factor for most of the findings. The licensee's corrective actions for this theme were: qualifications for performing apparent cause evaluations, and programmatic changes to require operating experience reviews along with independent checks.
Due to the continued cross-cutting theme associated with the corrective action program component of the problem identification and resolution area and NRC concerns with the licensee's scope of effort and progress in addressing this cross cutting theme, the March 5, 2012, end-of-cycle performance review opened a substantive cross-cutting issue in

the corrective action program component of the problem identification and resolution area [P.1(c)]. Specifically, the NRC noted that the licensee did not develop corrective actions to address identified concerns involving the utilization of resources to perform problem evaluations. The licensee acknowledged this theme and initiated CR-CNS-2012-01522 (NRC IR 2012-001 Identified Substantive Cross-Cutting Issue) on March 5, 2012. The licensee's investigation determined that the primary cause was management expectation error as a result of inadequate or inconsistent standards, secondary causes were; (1) control errors as a result of inadequate management oversight and follow-up of the noted issues, and (2) organizational interface breakdowns as a result of inadequate organization to organization performance in addressing the noted issues.

This baseline inspection semi-annual trend continues to monitor for sustainable performance improvements as evidenced by effective implementation of an appropriate corrective action plan that results in no safety significant inspection findings and a notable reduction in the overall number of inspection findings with the same common theme. The licensee has developed actions to focus on appropriate problem evaluation and resolution as well as the utilization of resources to perform problem evaluations.

These actions are still in progress and not scheduled to complete until July 2012, and the NRC continued to identify an increasing number of issues, 7 findings, associated with the corrective action program component of the problem identification and resolution area. As such, the NRC determined that the need to allow time to observe the effectiveness of the licensee improvement plan demonstrated by sustained improvement in corrective action program component of the problem identification and resolution area the NRC inspectors' baseline inspection program will continue to monitor for sustainable performance improvements through the rest of 2012.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

Because of the potential impact on plant safety of high water levels in the Missouri River valley, the inspectors reviewed CR-CNS-2010-01630, "NRC REVIEW OF EXTERNAL FLOODING ISSUES", which included actions to complete the analysis described in section 1R06 of this report.

b. Findings

Reviewing this condition report revealed that:

- To perform hydraulic modeling of the Missouri River valley in the vicinity of the plant, the licensee had contracted with a reputable company.

- With reference to distances from the mouth of the Missouri River (measured in River Miles (RMs)), the portion of the Missouri River that was modeled (the "project reach") was from just downstream of the confluence of the Nishnabotna River and the Missouri River near Peru, NE (RM 541.71) to just downstream of US Hwy 159 near Rulo, NE (RM 497.93). (Cooper Nuclear Station is located on

the right descending bank of the Missouri River centered approximately at RM 532.6.)

- The model was developed for evaluation by the Hydrologic Engineering Center River Analysis System (HEC-RAS) software.

- The modeling philosophy assumed that none of the levees within the project reach would breach. That philosophy also assumed that current known breaches in the levees would be repaired for the events modeled for this project.

- The model actually included four reaches: in addition to the reach in the main Missouri River valley channel, in approximately the upper half of the project reach, the left overbank area was modeled as three individual channel reaches whose boundaries were defined by the flanking levees in the overbank.

- Because existing data did not adequately characterize the Missouri River Basin, model development included collecting detailed topographical data of the project reach using Light Detection and Ranging (LiDAR) technology. The licensee also completed field reconnaissance of the Missouri River flood plain and its tributaries to confirm locations of levees, vegetation, and private structures, and to confirm roughness coefficients used in the model. Approximately 500,000,000 data points were collected and subsequently used to model 330 cross-sectional profiles within the project reach.

- For each of the events modeled, an event-specific flow hydrograph was used as the upstream boundary condition for the main Missouri River reach. For all of the events, the downstream boundary condition specified for the main Missouri River reach was a "normal depth" boundary condition, for which HEC-RAS calculates a water surface elevation associated with the flow at each timestep based on Manning's equation using the cross section and an energy gradient slope specified by the user. Because the energy gradient slope is usually unknown, the energy gradient slope was assumed to be equal to the average channel bed slope at the downstream end of the model.

- The licensee arranged for the U.S. Army Corps of Engineers staff to review the model. The U.S. Army Corps of Engineers response was documented in a letter to the licensee dated July 7, 2011. In that letter, the U.S. Army Corps of Engineers said that the general modeling approach was sound and followed accepted HEC-RAS hydraulic modeling practice, and that no significant deficiencies or errors were noted.

No finding was identified.

.5 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting resolution of a potential issue associated with the diesel generator starting air system. The inspectors selected this issue for review because the failure to properly address identified deficiencies or evaluate changes made to the facility and its supporting design analysis could have a significant impact on station equipment and result in systems not being able to perform their design function. The inspectors considered the following, as applicable, during the review of the licensee's actions: (1) complete and accurate identification of the problem in a timely manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of corrective actions; and (7) completion of corrective actions in a timely manner.

These activities constitute completion of one in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

Introduction. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions."

Description. NRC Component Design Bases Inspection Report 2010007 documented non-cited violation 2010007-04, "Inadequate Design Control," for the licensee's failure to perform suitable pre-operational testing to ensure each starting air receiver was capable of multiple starts of the emergency diesel generator as required by the system design. The licensee entered this deficiency into their corrective action program as Condition Report CR-CNS-2010-05294. The following corrective actions were developed and implemented: (1) the licnesee generated station calculation NEDC 11-072, Revision 0, "DGSA Accumulator Sizing Basis," to document that multiple starts were available from a single air accumulator in the starting air subsystem, and (2) the licensee updated the Updated Safety Analysis Report and technical specification basis based on the results from NEDC 11-072 to reflect that a single air accumulator was capable of providing sufficient air to perform multiple starts without immediate replenishment with pressure at least 200 psig in a starting air accumulator.

On April 30, 2012, inspectors reviewed NEDC 11-072 and the corrective actions documented in Condition Report CR-CNS-2010-05294. During their review the inspectors noted that the calculation had been based on pre-operational testing data that had been performed with both accumulators in service at an average starting pressure of 239.5 psig, and the number air starts performed was divided by two to determine the number of multiple starts a single accumulator was capable of. The inspectors determined that this calculation was not adequate to demonstrate the station's design

basis. Specifically, the calculation failed to demonstrate the ability of a single air receive to perfom multiple diesel generator starts form the required pressure.

The inspectors informed the licensee of their concerns and the licensee initiated Condition Report CR-CNS-2012-03039 to capture this concern in the corrective action program. The licensee subsequently performed an operability review and apparent cause evaluation. From the operability review the licensee took an action to keep diesel generator starting air accumulators cross tied, which was already controlled by procedures, and to resolve the issue by either changes in NEDC 11-072 or the Updated Safety Analysis Report and technical specification bases. From the apparent cause evaluation the licensee initiated the following corrective actions: (1) revise NEDC 11-072 to establish the design basis for two diesel generator air accumulators based on the pre-operational test data multiple starts without replenishment; and (2) revise the Updated Safety Analysis Report and technical specification bases to reflect the requirements of two diesel generator starting air accumulators. The inspectors have reasonable expections that the emergency diesel generators can perform multiple starts on a singel air allumulator.

Analysis. The licensee's failure to prepare an adequate design calculation demonstrating that a single diesel generator starting air accumulator was capable of performing multiple starts of an emergency diesel generator was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions and conduct effectiveness reviews to validate the underlying assumptions when determining the number of multiple starts on one diesel generator starting air accumulator [H.1(b)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," 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 nonconformance's are promptly identified and corrected." Contrary to the above, from July 23, 2010, to May 31, 2012, measures established by the licensee failed to assure that an identified condition adverse to quality was corrected.

Specifically, the licensee failed to prepare an adequate design calculation demonstrating that a single diesel generator starting air accumulator was capable of performing multiple

starts of an emergency diesel generator. Because the finding is of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Report CR-CNS-2012-03039, this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy:
NCV 05000298/2012003-13, "Fail to Correct a Condition Adverse to Quality for Determining the Number of Multiple Starts for a Single Diesel Generator Starting Air Accumulator."

.6 Heat Sink Performance

a. Inspection Scope

The inspectors evaluated several condition reports, including root cause and apparent cause analyses, related to the performance of the service water system, the reactor equipment cooling system, and the ultimate heat sink. The inspectors evaluated corrective actions related to the following specific items:

- Challenges related to operation of the Zurn strainers
- Implementation of the erosion/corrosion program, particularly, disposition and correction of thru-wall leaks
- Resolution of increased flow resistance in the service water system

The inspectors performed this evaluation by review of the corrective action program documents, review of records, and interviews with licensee personnel.

b. Findings

No findings were identified.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

Unplanned Down Power Due to the Failed Surveillance

a. Inspection Scope

On June 11, 2012, the inspectors responded to the control room in response to an unplanned down power caused by a failed surveillance test associated with a containment isolation valve. Inspectors toured the control room during the event to verify stable plant conditions, monitored the licensee's actions to restore the transformer to service, reviewed station logs, discussed the event with the operations and maintenance staff and reviewed NUREG-1022, "Event Reporting Guidelines," Revision 2, to ensure licensee compliance.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 (Closed) Temporary Instruction 2515/185 "Follow-up on the Industry's Ground Water Protection Initiative"

a. Inspection Scope

An NRC assessment of the licensee's groundwater protection program was performed the week of April 9, 2012, to determine whether the licensee implemented the program elements in this ground water protection program that were identified as incomplete in the Summary of Results from the Completion of NRC's Temporary Instruction on Groundwater Protection, TI-2515/173, "Industry Groundwater Protection Initiative" (ML11088A047). Descriptions of the program elements can be found in NEI 07-07, "Industry Ground Water Protection Initiative–Final Guidance Document," August 2007 (ML072610036). Inspectors interviewed personnel, performed walk-downs of selected areas, and reviewed the implementation of the following program elements:

- Element 1.1a–Perform hydrogeologic studies to determine predominant ground water flow characteristics and gradients
- Element 1.1 b–Review existing hydrogeologic and geologic studies, historical environmental studies and permit or license-related reports
- Element 1.1 c–Identify potential pathways for ground water migration from on-site locations to off-site locations through ground water
- Element 1.1d–Establish the frequency for periodic reviews of site hydrogeologic studies
- Element 1.2a–Identify each system, structure, and component and work practice that involves or could reasonably be expected to involve licensed material and for which there is a credible mechanism to reach ground water
- Element 1.2b–Identify existing leak detection methods for each system, structure, component, and work practice that involves or could involve licensed material and for which there is a credible potential for inadvertent releases to ground water
- Element 1.2c–Identify potential enhancements to leak detection systems or programs
- Element 1.2d–Identify potential enhancements to prevent spills or leaks from reaching ground water
- Element 1.2e–Identify the mechanism or site process for tracking corrective actions

- Element 1.2f–Establish long-term programs to perform preventative maintenance or surveillance activities to minimize the potential for inadvertent releases of licensed materials due to equipment failure

- Element 1.2g–Establish the frequency for periodic reviews of systems, structures, and components and work practices.

- Element 1.4a–Establish written procedures outlining the decision making process for remediation of leaks and spills or other instances of inadvertent releases

- Element 1.4b–Evaluate the potential for detectible levels of licensed material resulting from planned releases of liquids and/or airborne materials

- Element 1.4c–Evaluate and document, as appropriate, decommissioning impacts resulting from remediation activities or the absence thereof

- Element 2.4a–The appropriate changes to the Offsite Dose Calculation Manual or to the appropriate procedures were expected to be completed in a timeframe to support the 2007 report of 2006 performance for plants that were operating or decommissioning when the groundwater protection initiative was adopted

- Element 2.4b.i–Reporting of on-site ground water sample results shall be as follows: Ground water sample results that are taken in support of the Ground water Protection Initiative but are not part of the Radiological Environmental Monitoring Program are reported in the Annual Radiological Effluent Release Report required by 10 CFR 50.36a (a)(2)

b. Findings

Fifteen out of the sixteen elements were verified as complete. One element, 1.2 f, was still open as of the time of the inspection. Its completion is being tracked in Condition Report CR-CNS-2009-03669. No findings were identified.

.2 Failure to Use Design-Basis Parameter Values in Design-Related Calculations

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting a potential issue with a system credited with protection of other equipment during a high energy line break event. The inspectors selected this issue for review because of the frequency at which issues were being identified with high energy line break mitigating equipment, and because the failure to properly address identified deficiencies or evaluate changes made to the facility and its supporting design analysis could have a significant impact on station equipment and result in systems not being able to perform their design function. The inspectors considered the following, as applicable, during the review of the licensee's actions: (1) complete and accurate identification of the problem in a timely

manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of corrective actions; and (7) completion of corrective actions in a timely manner.

b. Findings

Introduction. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," associated with the licensee's failure to ensure that design bases parameters documented in the Updated Safety Analysis Report were used for station activities.

Description. On December 18, 1972, and January 19, 1973, the NRC sent letters to the licensee requesting a detailed design evaluation to substantiate that the design of Cooper Nuclear Station was adequate to withstand the effects of a postulated rupture in any high energy fluid piping systems outside the primary containment. This included the double-ended rupture of the largest line in the Main Steam and Feedwater systems.

In April and June of 1973, the licensee submitted Final Safety Analysis Report Amendments 20 and 25 which summarized the station's analysis of the postulated high energy pipe ruptures outside primary containment. In Amendment 25, Section III D.10(a)(2) the licensee stated, in part, that the failure of either of the main steam lines in the turbine area would result in a peak turbine building pressure of 0.56 psid in the building area, and that the buildings siding would blow out at 0.5 psid which would completely vent the steam/water mixture in the upper building area to the outside atmosphere, completely pressure relieving the space.

On July 16, 1973, the NRC issued Supplement 1 to the Safety Evaluation Report for Cooper Nuclear Station. Section 10.4, "Postulated Ruptures in High Energy Fluid Pipes Outside the Primary Containment," which concluded that the licensee had examined all potential safety related high energy pipe break locations and evaluated their consequences, and as a result of the NRC's review of the results the licensee committed to make the following modifications to assure that the safe shutdown capability will not be degraded should any of the postulated pipe ruptures actually occur:

A. Installation of a pipe whip restraining structure or replacement of a section of pipe with heavier wall pipe for certain sections of service water and the RHR heat exchanger return lines.

B. Installation of a high temperature alarm to annunciate in the control room in the event of a building heating steam line break.

C. Replace present hollow metal doors and frames in potential steam flow paths to the control room.

The inspectors determined that: (1) the Updated Safety Analysis Report incorporated by reference these amendments to demonstrate how the site meets the high energy line

break analysis requirement, therefore the information in these amendments is part of the plants licensing basis and; (2) the information provided in Final Safety Analysis Report Amendment 25 Section III D.10(a)(2) was design bases information as defined by 10 CFR 50.2, "Definitions," in that this amendment identified the specific function to be performed by the siding (blow out), at the specific pressure of 0.5 psid, which had been derived from an analysis to demonstrate how the station's design requirement to show protection for required safety-related equipment required for mitigation of a turbine building high energy line break was met.

On March 3, 2011, the licensee issued Revision 3 of calculation NEDC 03-005, "Turbine Generator Building Siding Blowout Pressure," which re-calculated the differential pressure at which the turbine generator building siding could be expected to fail. The inspectors reviewed the revised calculation and noted that the new calculated failure pressure was lower than what was documented as the station's design bases. Specifically, the new result was siding failure at 0.3 psid instead of 0.5 psid as identified in Final Safety Analysis Report Amendment 25.

The inspectors identified two examples where the licensee had begun to use this new failure pressure to support plant operations and evaluations instead of the failure pressure documented in the station's Updated Safety Analysis Report. Specifically, the licensee generated NEDC 11-075, "Turbine Building High Energy Line Break," Revision 1, to evaluate past operability concerns associated with breaching high energy line break doors that protected the emergency diesel generators and control room equipment, and a sensitivity study dated October 17, 2011, used to support breaching a high energy line break door to support planned maintenance.

The inspectors reviewed both the new calculation and the sensitivity study. During their review they noted that using the lower failure pressure would lower the overall pressure that doors were subject to in the areas being evaluated and would reduce the amount of steam assumed to be present in the spaces that could affect equipment. The inspectors determined that this was nonconservative with regard to the plant's design and licensing bases.

Subsequently, the inspectors engaged the licensee with their concerns, specifically the use of the new lower failure pressure instead of the design bases failure pressure documented in Final Safety Analysis Report Amendment 25. Based on responses from the licensee, the inspectors determined that they had not recognized the information in amendment as design bases information, and had not controlled the information as design bases information.

The licensee subsequently determined that the information in Final Safety Analysis Report Amendment 25 was design basis information, and stopped using the failure pressure calculated in Revision 3 of NEDC 03-005.

Analysis. The licensee's failure to maintain design control when performing an operability evaluation and sensitivity study, with respect to the turbine building high energy line break analysis, is a performance deficiency. This performance deficiency

was determined to be more than minor because if left uncorrected, the licensee's practice of basing design-related analyses on parameter values that don't represent the design bases, has the potential to lead to a more significant safety concern. Specifically, if the licensee bases analyses on a particular parameter value that doesn't represent the design bases and if that parameter value differs from the corresponding design-basis value in a nonconservative manner, then the licensee could reasonably complete an operability assessment based on the nonconservative parameter value and determine that a safety-related system is operable, when an operability assessment based on the design-basis parameter value would have determined that the system is inoperable. As a result, a safety-related system could remain in an undetected inoperable state for an indefinite period of time, and is therefore a finding. Using Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the inspectors determined this finding has very low safety significance (Green) because it was not a design or qualification issue confirmed not to result in a loss of operability or functionality, did not represent an actual loss of safety function of system or train, did not result in the loss of one or more trains of nontechnical specification equipment, and did not screen as potentially risk-significant due to seismic, flooding, or a severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of human performance, associated with the decision-making component in that the licensee failed to use conservative assumptions in decision making when they failed to recognize and control design bases information [H.1(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control", states, in part, that, "measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2 and as specific in the license application, for those components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Contrary to the above, in August and October, 2011, measures established by the licensee failed to ensure that the design basis was correctly translated into specifications. Specifically, the licensee failed to assure that the facilities design bases for the turbine building siding failure pressure was correctly translated into specifications, drawings, procedures, and instructions. Consequently, the licensee based NEDC 11-075, "Turbine Building High Energy Line Break", Revision 1, and a sensitivity study dated October 17, 2011, in part, on the turbine building siding blowing out at a differential pressure other than what was specified as the design basis. Because the finding is of very low safety significance and has been entered into the corrective action program as Condition Reports CR-CNS-2011-10391 and CR-CNS-2011-11861, the violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000298/2012003-14, "Failure to Use Design-Basis Parameter Values in Design-Related Calculations."

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 12, 2012, the inspectors presented the results of the radiation safety inspections to Mr. D. Willis, General Manager Plant Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any

materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On May 18, 2012, the inspectors presented the results of the heat sink inspection to Mr. D. Willis, General Manager Plant Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On April 27, 2012, the inspectors presented the results of the focused baseline inspection for external flooding to Mr. B. O'Grady, Vice President-Nuclear and Chief Nuclear Officer and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On June 25, 2012, the inspectors presented the inspection results to Mr. A Zaremba, Director of Nuclear Safety Assurance, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section 2.3.2 of the NRC Enforcement Policy for being dispositioned as a non cited violation.

.1 Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that, "measures shall be established to assure that applicable regulatory requirements and the design bases, as defined in 10 CFR 50.2 and as specified in the license application, for those components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Contrary to the above, the licensee identified from April 1990 to May 2012, that they failed to maintain the design control of the residual heat removal suction strainers maximum calculated heat loss during design basis accident. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event.

.2 Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," 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 nonconformance's are promptly identified and corrected." Contrary to the above, until April 17, 2012, the licensee identified a failure to follow procedure that resulted in the inadequate lubrication of service water valves SW-V-1281 and SW-V-1282, which caused them to become sticky and difficult to open. Service water valve SW-V-1282 was repaired and SW-V-1281 is currently clapped open. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. The inspectors evaluated the finding using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because the finding: (1) was not a design or qualification issue confirmed not to result in a loss of operability or functionality; (2) did not represent an actual loss of safety function of system or train; (3) did not result in the loss of one or more trains of nontechnical specification equipment; (4) did not screen as potentially risk significant due to seismic, flooding, or severe weather initiating event.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Bednar, Supervisor, Radiation Protection
R. Beilke, Manager, Radiation Protection
J. Dixon, Supervisor, Radiation Protection
J. Flaherty, Senior Licensing Engineer
G. Gardner, Supervisor, Systems Engineering
G. Handley, Electrical/Instrumentation and Control Engineer
D. Kiekel, Electrical Systems Engineer
P. Leininger, Erosion/Corrosion Program Engineer
E. McCutchen, Senior Licensing Engineer, Licensing
A. Meinke, Manager, Chemistry
D. Oshlo, Acting Manager, Radiation Protection
G. Pietrowski, Heat Exchanger and Pump Program Engineer
T. Robinson, Inservice Test Program Engineer
C. Stipp, Environmental Engineer
J. Teten, Supervisor, Chemistry
D. Van Der Kamp, Manager, Licensing
C. Walters, Service Water System Engineer
D. Willis, General Manager, Plant Operations
A. Zaremba, Director, Nuclear Safety Assurance

NRC Personnel

J. Josey, Senior Resident Inspector
C. Henderson, Resident Inspector
B. Hagar, Senior Project Engineer
G. George, Senior Reactor Inspector
L. Carson II, Senior Health Physicist
C. Alldredge, Health Physicist
G. Pick, Senior Reactor Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000298/2012003-01	NCV	Failure to Perform Adequate Postmaintenance Testing (Section 1R12)
05000298/2012003-02	NCV	Failure to Ensure Compliance with the Requirements of Station Troubleshooting Procedure (Section 1R13)
05000298/2012003-03	NCV	Failure to Recognize the Need for An Evaluation and to Properly Document the Bases for Operability (Section 1R15)

Opened and Closed

05000298/2012003-04	NCV	Failure to Maintain Design Control of the Standby Liquid Control System and Sumps Credited in the Internal Flooding Analysis (Section 1R15)
05000298/2012003-05	NCV	Failure to Furnish Evidence of an Activity Affecting Quality (Section 1R15
05000298/2012003-06	NCV	Design Changes Not Appropriately Approved by the Licensee (Section 1R15)
05000298/2012003-07	NCV	Failure to Evaluate Changes for Adverse Impacts (Section 1R18)
05000298/2012003-08	NCV	Non-conservative Service Water Booster Pump A and D Differential Pressure Operability Limits During In-Service Surveillance Testing (Section 1R22)
05000298/2012003-09	NCV	Failure to Follow Radiation Work Permit Requirements (Section 1R22)
05000298/2012003-10	NCV	Failure to Perform a Radiation and Contamination Survey (Section 2RS2)
05000298/2012003-11	FIN	ALARA Program Failed to Prevent Unintended Doses for Refueling Floor Activities, Outage RE26 (Section 2RS2)
05000298/2012003-12	NCV	Failure to Maintain Design Control of the Essential Ventilation System (Section 4OA2)
05000298/2012003-13	NCV	Fail to Correct a Condition Adverse to Quality for Determining the Number of Multiply Starts for a Single Diesel Generator Starting Air Accumulator (Section 4OA2)
05000298/2012003-14	NCV	Failure to Use Design-Basis Parameter Values in Design-Related Calculations

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
DCD-1	Design Criteria Document, "Diesel Generators"	
DCD-12	Design Criteria Document, "Core Spray"	
DCD-13	Design Criteria Document, "Residual Heat Removal"	
DCD-16	Design Criteria Document, "Reactor Equipment Cooling"	
11-072	NEDC, "DGSA Accumulator Sizing Basis"	0

Section 1R04: Equipment Alignment

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
86-095	NEDC	1
87-068	NEDC	0
88-123	NEDC	0
88-190	NEDC, "Essential Pump Minimum Flow Damage Susceptibility–NRC 88-04"	
91-239	NEDC	4
92-050X	NEDC, "REC-PS-452A, 452B1, 452B2 Setpoint Calculation"	
94-142	NEDC, "Core Spray Flows with Minimum Flow Bypass Valve Open"	4
94-230	NEDC, "Vessel Heat-Over-Drywell Capacity Curve for Input into ECCSA Analysis"	4
94-258	NEDC, "Tech Spec Acceptance Criteria for LPCI Pumps at flowing at 7800 gpm"	2
97-044A	NEDC, "NPSH Margins for the RHR and CS Pumps"	4
Volume I Section II	USAR, "Station Site and Environs"	
Volume II Section IV	USAR, "Reactor Coolant System"	
Volume II Section V	USAR, "Containment"	
Volume II Section VI	USAR, "Core Standby Cooling System"	
Volume IV Section X	USAR, "Auxiliary Systems"	
Volume V Section XII	USAR, "Structures and Shielding"	
Volume VI Appendix C	USAR, "Structural Loading Criteria"	

PROCEDURES

NUMBER	TITLE	REVISION
2.2.20	Operations Procedure, "Standby AC Power System (Diesel Generator)"	83
2.2.71	Operations Procedure, "Service Water System"	111
2.2A.DG.DIV1	Operations Procedure, "Standby AC Power System (Diesel Generator) Component Checklist (DIV 1)"	6
2.2A.DG.DIV2	Operations Procedure, "Standby AC Power System (Diesel Generator) Component Checklist (DIV 2)"	5
2.2B.DG. DIV1	Operations Procedure, "Standby AC Power System (Diesel Generator) Instrument Valve Checklist (DIV 1)"	1
6.REC.301	Surveillance Procedure, "REC Non-Critical Loop Low Pressure Isolation Calibration and Functional Test REC-PS-452A"	9
6.1REC.301	Surveillance Procedure, "REC HX A Outlet Header Low Pressure Isolation Calibration and Logic System Functional Test REC-PS-452B1"	11
6.1RHR.101	Surveillance Procedure, "RHR Test Mode Surveillance Operation (IST)(DIV 1)"	27
6.2REC.301	Surveillance Procedure, "REC HX B outlet Header Low Pressure Isolation Calibration and Logic System Functional Test REC-PS-452B2"	13
6.2RHR.101	Surveillance Procedure, "RHR Test Mode Surveillance Operation (IST)(DIV 2)	

CONDITION REPORTS

CR-CNS-2007-00925	CR-CNS-2008-05860	CR-CNS-2009-05746	CR-CNS-2009-05845
CR-CNS-2010-05294	CR-CNS-2012-02272	CR-CNS-2012-03135	CR-CNS-2012-03366
CR-CNS-2012-03460	CR-CNS-2012-03634		

Section 1R05: Fire Protection

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
	CNS Fire Hazard Analysis, Fire Area I, Fire Zone 1B and 1C	February 28, 2003

Section 1R05: Fire Protection

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
	CNS Fire Hazard Analysis, Fire Area IV, Fire Zone 7A	February 28, 2003
	CNS Fire Hazard Analysis, Fire Area X, Fire Zone 14B	February 28, 2003
	CNS Fire Hazard Analysis, Fire Area X, Fire Zone 14D	November 5, 2007
T3.11.1	Technical Requirements Manual, "Fire Detection Instrumentation"	

PROCEDURES

NUMBER	TITLE	REVISION
5.1 Incident	Emergency Procedure, "Site Emergency Incident"	22

CONDITION REPORTS

CR-CNS-2011-01317

Section 1R07: Heat Sink Performance Triennial Review

CALCULATIONS

NUMBER	TITLE	REVISION
91-239	Diesel Generator (DG) Lube Oil/DG Jacket Water/DG Intercooler Heat Exchanger Evaluation	4
93-184	Residual Heat Removal (RHR) Heat Exchangers Thermal Performance and Tube Plugging Margin	2
94-021	Reactor Equipment Cooling (REC) Heat Exchanger A and REC Heat Exchanger B Maximum Allowable Accident Case Fouling	6
12-026	Test Data Analysis and Thermal Performance Evaluation for the Cooper Nuclear Station RHR Heat Exchanger B	0

DRAWINGS

NUMBER	TITLE	REVISION
2006, Sheet 1	Circulating, Screen Wash, & Service Water Systems	76
2006, Sheet 2	Circulating, Screen Wash, & Service Water Systems	44
2006, Sheet 3	Circulating, Screen Wash, & Service Water Systems	53
2006, Sheet 4	Control Building Service Water System	46
2031, Sheet 1	Reactor Building–Closed Cooling Water System	21
2031, Sheet 2	Reactor Building–Closed Cooling Water System	65
2031, Sheet 3	Reactor Building–Closed Cooling Water System	30
2036, Sheet 1	Reactor Building Service Water System	98
4118, Sheet 1	Intake Structure Guide Wall Plan, Sections, and Details	7
4118, Sheet 2	Intake Structure Guide Wall Plan, Sections, and Details	2
4118, Sheet 3	Replacement Guide Wall Elevation and Sections	1
4118, Sheet 4	Replacement Guide Wall Sections	1
4118, Sheet 5	Replacement Guide Wall Details	1

EDDY CURRENT TEST REPORTS

NUMBER	TITLE	DATE
4464370	DGLO Cooler / DGLO-HX-LO2	March 19, 2011
4498845	DGJW Cooler / DGJW-HX-JW2	September 10, 2007
4498847	DGLO Cooler / DGLO-HX-LO2	September 10, 2007
4625815	REC Heat Exchanger B	February 5, 2009
4625816	REC Heat Exchanger A	February 9, 2009
4664368	DGJW Cooler / DGJW-HX-JW2	March 19, 2011
4718578	RHR Heat Exchanger B	January 14, 2010
4803558	REC Heat Exchanger B	February 22,

EDDY CURRENT TEST REPORTS

NUMBER	TITLE	DATE
		2012
4803560	REC Heat Exchanger A	February 25, 2012

LETTERS

NUMBER	TITLE	DATE
CNSS907024	Response to Generic Letter 89-13	January 29, 1990
NLS9000459	Generic Letter 89-13 Recommended Inspection Program	October 15, 1990
NSD920007	Completion of Generic Letter 89-13 Actions	January 9, 1992
NLS980016	Clarification of Commitments with Respect to NRC Inspection Report Nos. 97-07 and 97-12	January 28, 1998

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
	Action List, "Asiatic Clam Action Matrix"	April 26, 2006
	CNS Aquatic Biofouling Plan Environmental Response	January 2007
	Design Specifications for the Residual Heat Removal, Reactor Equipment Cooling, Diesel Generator Jacket Water , and Diesel Generator Lube Oil Heat Exchangers	
	Final Report Corbicula (Asiatic Clams) Monitoring and Mitigation Service Water System Evaluation	June 2006
	First Quarter 2012 Heat Exchanger Health Report	
	Maintenance Plan for Service Water Expansion Joints	
	NALCO Recommendation for Cooper Service Water Treatment	October 26, 2011
	Service Water System Health Report	April 2012
	Residual Heat Removal Heat Transfer Test Trend Plots for Last 10-years	
	Underground Piping Specifications	

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
	Updated Final Safety Analysis Report, Sections 6.0, Reactor Equipment Cooling System, and 8.0, Service Water and RHR Service Water Booster System	
	3-Year Trends of Reactor Equipment Cooling Pure Water Chemistry Parameters	
1007820	Closed Cooling Water Chemistry Guideline–Revision to TR-107396	1
2005	Zebra Mussel Monitoring/Control Plan	
2010	Aquatic Bio-fouling Organisms Annual Monitoring Report	January 2011
4576472	Work Order, "Visual Inspection of Division 2 Buried Service Water Piping"	April 25, 2008
89-13	Generic Letter, "Service Water System Problems Affecting Safety Related Equipment"	July 18, 1989
89-13 Supplement 1	Generic Letter, "Service Water System Problems Affecting Safety-Related Equipment"	April 4, 1990
CED 6029209	Zurn Service Water Strainer Replacements	January 12, 2012
CNS-2010-08746	Chemical Treatment of Service Water System	August 10, 2011
EPRI NP 7552	Heat Exchanger Performance Monitoring Guidelines	December 1, 1991
PBD-EC	Erosion/Corrosion Program Basis Document	0
PBD-HX	Heat Exchanger Program Basis Document	3
QAD20060046	Audit 06-05, Engineering	July 26, 2006
SA-2008-00162	Heat Exchanger GL 89-13 Program	April 30, 2008
SIR-98-094	Effects of River Water Service on Cooper Plant Systems Final Report	March 24, 1998

PROCEDURES

NUMBER	TITLE	REVISION
2.1.11.1	Operations Procedure, "Turbine Building Data"	126
2.2.3.1	Operations Procedure, "Traveling Screen, Screen Wash, and	83

PROCEDURES

NUMBER	TITLE	REVISION
	Sparger System"	
2.2.3.2	Operations Procedure, "Intake Structure Sonar Equipment"	16
2.2.65.1	Operations Procedure, "REC Operations"	62
2.2.71.1	Operations Procedure, "Service Water System"	111
3.9	Engineering Procedure, "ASME OM Code Testing of Pumps and Valves"	25
3.10	Engineering Procedure, "Erosion/Corrosion Program"	11
3.13	Engineering Procedure, "Buried Piping and Tanks Inspection Program"	0
3.13.1	Engineering Procedure, "Buried Piping and Tanks Inspection Program Implementation"	0
3.30	Engineering Procedure, "Macroscopic Biological Fouling Organism Sampling"	9
5.2SW	Emergency Procedure, "Service Water Casualties"	22
6.PC.516	Surveillance Procedure, "Reactor Equipment Cooling (REC) Local Leak Rate Tests"	11
6.REC.201	Surveillance Procedure, "REC Motor Operated Valve Operability Test (IST)"	19
6.REC.401	Surveillance Procedure, "REC-CV-16CV IST Closure Test"	13
6.SW.102	Surveillance Procedure, "Service Water System Post-LOCA Flow Verification"	37
6.SW.202	Surveillance Procedure, "Service Water Power-Operated Valve Operability Test"	16
6.SWBP.201	Surveillance Procedure, "SW-MO-89A/B Full Stroke Operability (IST)"	3
6.1REC.101	Surveillance Procedure, "REC Surveillance Operation (IST) (DIV 1)"	12
6.1REC.102	Surveillance Procedure, "REC Critical Subsystem Emergency Mode Flow Test (DIV 1)"	10
6.1SW.101	Surveillance Procedure, "Service Water Surveillance Operation (DIV 1) (IST)"	36
6.1SWBP.101	Surveillance Procedure, "RHR Service Water Booster Pump Flow Test and Valve Operability Test (DIV 1)"	19

PROCEDURES

NUMBER	TITLE	REVISION
6.2REC.101	Surveillance Procedure, "REC Surveillance Operation (IST) (DIV 2)"	10
6.2REC.102	Surveillance Procedure, "REC Critical Subsystem Emergency Mode Flow Test (DIV 2)"	10
6.2SW.101	Surveillance Procedure, "Service Water Surveillance Operation (DIV 2) (IST)"	36
6.2SW.401	Surveillance Procedure, "Service Water Check Valve Closure Test"	15
6.2SWBP.101	Surveillance Procedure, "RHR Service Water Booster Pump Flow Test and Valve Operability Test (DIV 2)"	18
7.2.42	Maintenance Procedure, "Heat Exchanger Cleaning"	26
7.2.42.1	Maintenance Procedure, "REC Heat Exchanger Maintenance"	9
7.2.42.2	Maintenance Procedure, "RHR Heat Exchanger Maintenance"	8
7.2.42.3	Maintenance Procedure, "Heat Exchanger Tube Plugging"	13
8.2.1	Chemistry Procedure, "Chemistry Analysis Schedule"	65
8.3	Chemistry Procedure, "Control Parameters and Limits"	66
13.15.1	Performance Evaluation Procedure, "Reactor Equipment Cooling Heat Exchanger Performance Analysis"	32
13.17.2	Performance Evaluation Procedure, "Thermal Performance Test Procedure for Reactor Heat Removal Heat Exchangers"	6
14.28.1	Instrument and Control Procedures, "Service Water System Instrument Calibration"	28

CONDITION REPORTS

CR-CNS-2006-03798	CR-CNS-2006-03810	CR-CNS-2006-03824	CR-CNS-2006-04061
CR-CNS-2006-04171	CR-CNS-2006-04411	CR-CNS-2006-04555	CR-CNS-2006-04654
CR-CNS-2008-04325	CR-CNS-2009-08110	CR-CNS-2009-09990	CR-CNS-2009-10440
CR-CNS-2010-01047	CR-CNS-2010-01659	CR-CNS-2010-03116	CR-CNS-2010-03561
CR-CNS-2010-04447	CR-CNS-2010-04697	CR-CNS-2010-05420	CR-CNS-2010-09226
CR-CNS-2010-09230	CR-CNS-2011-01619	CR-CNS-2011-01683	CR-CNS-2011-04667
CR-CNS-2011-05246	CR-CNS-2011-05770	CR-CNS-2011-05945	CR-CNS-2011-08457

CR-CNS-2011-08472	CR-CNS-2011-08661	CR-CNS-2011-08812	CR-CNS-2011-08961
CR-CNS-2011-09344	CR-CNS-2011-09415	CR-CNS-2011-10538	CR-CNS-2011-10539
CR-CNS-2011-10546	CR-CNS-2012-01685	CR-CNS-2012-02292	CR-CNS-2012-03485

WORK ORDERS

4418058	4498845	4498847	4499462
4625958	4639609	4639810	4645745
4664230	4664368	4664370	4664591
4702650	4705223	4705224	4705312
4705428	4705429	4705555	4705556
4705581	4705605	4705606	4705704
4705705	4705828	4705829	4705852
4705876	4705877	4705970	4705971
4706091	4706093	4706116	4706140
4706141	4717269	4718578	4732310
4733180	4733205	4733306	4733332
4733350	4733368	4738274	4740776
4742229	4749895	4749898	4750526
4753131	4753132	4753158	4753201
4753261	4753262	4753263	4753297
4753308	4753322	4753323	4754557
4754558	4754664	4754940	4757004
4757005	4758919	4758920	4759014
4759041	4759059	4759060	4762177
4762239	4785280	4803558	4803560
4809914	4813307	4813308	4813335
4813379	4813436	4813437	4813438
4813471	4813502	4813503	4813587
4813588	4813624	4813707	4813708
4813723	4813739	4813740	4824116

4824454	4825772	4826741	4838551
4850813	4855940	4860470	

Section 1R12: Maintenance Effectiveness

MISCELLANEOUS PROCEDURES

NUMBER	TITLE	DATE
DCD-16	Design Criteria Document, "Reactor Equipment Cooling"	April 4, 2011
Volume IV Section X-6	USAR, "Auxiliary Systems"	

PROCEDURES

NUMBER	TITLE	REVISION
5.2REC	Emergency Procedure, "Loss of REC"	13

CONDITION REPORTS

CR-CNS-2012-03302

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

NUMBER	TITLE	REVISION
0-Protect-Eqp	Administrative Procedure, "Protected Equipment Program"	22
0.49	Administrative Procedure, "Scheduled Risk Assessment"	30
7.0.1.7	Maintenance Procedure, "Troubleshooting Plant Equipment"	15

CONDITION REPORTS

CR-CNS-2011-02717	CR-CNS-2012-02465	CR-CNS-2012-02717	CR-CNS-2012-02914
CR-CNS-2012-04170			

WORK ORDERS

4863518	4888474	4898664	4963518

Section 1R15: Operability Evaluations

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
09-0102	NEDC, "Internal Flooding–HELB, MELB, and Feedwater Line Break"	0
11-150	NEDC, "Evaluation of Maintenance Impacts on the Internal Flood Analysis (Power Block)"	0
12-015	NEDC, "Standby Liquid Control Test Tank Seismic Evaluation"	0
99-056	NEDC, "Evaluation of RHR Service Water Booster Pump Needed Differential Pressure"	0
Book 35	Burns and Roe Index of Civil Structural Book	February 13, 1970
Volume I Section 9	USAR, "Standby Liquid Control System"	February 5, 2010
Volume VI Appendix C	USAR, "Structural Loading Criteria"	August 8, 2012

PROCEDURES

NUMBER	TITLE	REVISION
0.41	Administrative Procedure, "Seismic Housekeeping"	8

CONDITION REPORTS

CR-CNS-2011-09344	CR-CNS-2012-01918	CR-CNS-2012-02272	CR-CNS-2012-02343
CR-CNS-2012-02414	CR-CNS-2012-02426	CR-CNS-2012-02497	CR-CNS-2012-02500
CR-CNS-2012-02509	CR-CNS-2012-02510	CR-CNS-2012-02519	CR-CNS-2012-02540
CR-CNS-2012-02572	CR-CNS-2012-02752	CR-CNS-2012-02767	CR-CNS-2012-02869
CR-CNS-2012-03086	CR-CNS-2012-03137	CR-CNS-2012-03238	CR-CNS-2012-03263
CR-CNS-2012-03305	CR-CNS-2012-03337		

Section 1R18: Plant Modifications

WORK ORDERS

4785757

Section 1R19: Post-Maintenance Testing

PROCEDURES

NUMBER	TITLE	REVISION
6.HPCI.102	Surveillance Procedure, "HPCI Test Mode Surveillance Operation from ASD-HPCI Panel"	26
6.HPCI.103	Surveillance Procedure, "HPCI IST and 92 Day Test Mode Surveillance Operation"	43
6.HPCI.316	Surveillance Procedure, "HPCI Control System Calibration Test"	16
6.SC.202	Surveillance Procedure, "Secondary Containment (RRMG H&V) Valve Operability Testing (IST)"	11
6.SC.301	Surveillance Procedure, "Secondary Containment Isolation AOV Accumulator Functional and Check Valve Exercise Test"	8
6.1RHR.101	Surveillance Procedure, "RHR Test Mode Surveillance Operation (IST) DIV 1"	27
6.1RHR.201	Surveillance Procedure, "RHR Power Operated Valve Operability (IST) (DIV 1)"	23
6.1RHR.201	Surveillance Procedure, "RHR Power Operated Valve Operability (IST) (DIV 1)"	24
7.0.5	Maintenance Procedure, "Post-Maintenance Testing"	40

CONDITION REPORTS

CR-CNS-2011-10339	CR-CNS-2012-02532	CR-CNS-2012-02566	CR-CNS-2012-03947

WORK ORDERS

4685238			
4750537	4750544	4766672	4802950
4785757	4803050	4803052	4803819
4804043	4823077	4888474	4896553
4896682	4897540		

Section 1R22: Surveillance Testing

PROCEDURES

NUMBER	TITLE	REVISION
6.HPCI.201	Surveillance Procedure, "HPCI Valve Operability Test (IST)"	18
6.1CS.702	Surveillance Procedure, "CS Loop A Pump Time Delay Channel Functional Test (DIV 1)	4
6.1SWBP.101	Surveillance Procedure, "RHR Service Water Booster Pump Flow Test and Valve Operability Test (DIV 1)"	20
6.1REC.101	Surveillance Procedure, "REC Surveillance Operation (IST)(DIV 1)"	12
6.1REC.302	Surveillance Procedure, "REC Pumps Time Delay Relay Testing and Setting (DIV 1)"	16
99-056	NEDC, "Evaluation of RHR Service Water Booster Pump Needed Differential Pressure	0

CONDITION REPORTS

CR-CNS-2011-09344	CR-CNS-2011-07980	CR-CNS-2011-09444	CR-CNS-2012-02343
CR-CNS-2012-02497	CR-CNS-2012-02500		

WORK ORDERS

4801847	4849580	4854121	4865001

Section 2RS2: Occupational ALARA Planning and Controls

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

NUMBER	TITLE	DATE
LO-CNSLO 2011-0114	Focused Self-Assessment (Source Term Mitigation and Control Focused Assessment)	February 17, 2012
2011-11030	CAT C "IER Level 2 Document" Evaluation	February 15, 2012

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
2011-05	RE26 Refuel Floor Activities (ALARA Post Job Review)	November 30, 2011

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
2011-4891	Cat B (H) Apparent Cause Evaluation–Rx Cavity Decon Event	June 25, 2011
CNS-RP-38	Calculation of Person-Rem Worksheet Package #2011-05, Rev 0, RE-26: Refuel Floor Totals of All Job Packages	January 21, 2011
	RE26 Post Outage ALARA Report	
	Refuel Floor Scope Changes 1,2, & 3 Total Intended Refuel Floor	
	IVVI Platform Decon Job Package	
	Cycle 27 Business Plan: Section II. Source Term and Dose Reduction	

PROCEDURES

NUMBER	TITLE	REVISION
9.ALARA.0	CNS ALARA Program	5
9.ALARA.4	Radiation Work Permits	15
9.ALARA.5	ALARA Planning and Controls	20, 21, 22, 23
9.EN-RP-110	ALARA Program	4
9.EN-RP-110-04	Radiation Protection Risk Assessment Process	1

RADIATION WORK PERMIT

NUMBER	TITLE	REVISION
2011-435	Rx Disassemble / Re-assemble	0
2011-436	Rx Cell maintenance / Fuel Moves	1
2011-437	LPRM Replacement	0
2011-438	Refuel Floor Support Activities	10

CONDITION REPORTS

CR-CNS-2011-01396	CR-CNS-2011-03011	CR-CNS-2011-04568	CR-CNS-2011-04753
CR-CNS-2011-04757	CR-CNS-2011-04915	CR-CNS-2011-05227	CR-CNS-2011-06337
CR-CNS-2011-06920	CR-CNS-2011-01491	CR-CNS-2011-07340	CR-CNS-2011-07375

CR-CNS-2011-11774 CR-CNS-2012-00903 CR-CNS-2012-01764 CR-CNS-2012-02550
CR-CNS-2012-02551 CR-CNS-2012-02650 CR-CNS-2012-02652

Section 2RS4: Occupational dose Assessment

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

NUMBER	TITLE	DATE
WT-CNS-2004-0 CA 682	2011 Internal Dose Assessment Prospectus	
	2012 Internal Dose Assessment Prospectus	
	NUPIC Joint Audit of GEL Laboratories, LLC	December 13, 2011

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
Pack 1215	RP-64 EDEex Calculation Worksheet Multiple-Dosimeter Method	
Pack 1269	RP-64 EDEex Calculation Worksheet Multiple-Dosimeter Method	
Pack 1205	RP-64 EDEex Calculation Worksheet Multiple-Dosimeter Method	
Pack 1295	RP-64 EDEex Calculation Worksheet Multiple-Dosimeter Method	
CNS-RP-136	Air Sample Assay–Elev 1001' Gooseneck	April 22, 2011
CNS-RP-136	Air Sample Assay–Elev 1001' Gooseneck	April 22, 2011
CNS-RP-136	Air Sample Assay–Elev 1001' Lo Vol	April 22, 2011
CNS-RP-136	Air Sample Assay–Elev 1001' Lo Vol Gooseneck	April 21, 2011
CNS-RP-136	Air Sample Assay–Elev 1001' Lo Vol	April 21, 2011
CNS-RP-136	Air Sample Assay–Elev 976' Hi Vol	April 21,2011
CNS-RP-136	Air Sample Assay–Elev 1001' Hi Vol	April 21, 2011
CNS-RP-136	Air Sample Assay–Elev 1001' Lo Vol	April 21, 2011
(W) 01-05-R4	CNS Radiological Protection White Paper: Airborne Radioactivity Scaling Factor for Hard to Identify Nuclides	August 29, 2011
(W) 09-02 R2	CNS Radiological Protection White Paper: Multiplication Factor for the Merlin Gerin DMC 2000 S	February 3, 2011

PROCEDURES

NUMBER	TITLE	REVISION
9.ALARA.1	Rad Protection Procedure	40
9.ALARA.3	Operation of the Canberra Fastscan Whole Body Counter	16
9.ALARA.4	Radiation Work Permits	15
9.ALARA.5	ALARA Planning and Controls	23
9.ALARA.13	Radiation Worker and Tour Group Dosimetry Management	17
9.EN-RP-101	Access Control for Radiologically Controlled Areas	9
9.EN-RP-108	Radiation Protection Posting	6
9.EN-RP-110-04	Radiation Protection Risk Assessment Process	1
9.EN-RP-110	ALARA Program	4
9.EN-RP-141	Job Coverage	11
9.EN-RP-203	Dose Assessment	2
9.EN-RP-205	Prenatal Monitoring	0
9.EN-RP-208	Whole Body Counting and In-Vitro Bioassay	1
9.RADOP.1	Radiation Protection at CNS	12
9.RADOP.2	Radiations Safety Standards and Limits	15
9.RADOP.5	Airborne Radioactivity Sampling	24
9.RADOP.19	Reactor Cavity/ Equipment Pit Decon	0
9.RW.7	Waste Stream Sampling	13

CONDITION REPORTS

CR-CNS-2010-07076	CR-CNS-2010-08769	CR-CNS-2010-08770	CR-CNS-2011-00119
CR-CNS-2011-01722	CR-CNS-2011-02237	CR-CNS-2011-02161	CR-CNS-2011-02199
CR-CNS-2011-02662	CR-CNS-2011-03865	CR-CNS-2011-04536	CR-CNS-2011-04891
CR-CNS-2011-04967	CR-CNS-2011-06920	CR-CNS-2011-07448	CR-CNS-2011-07571
CR-CNS-2011-07680	CR-CNS-2011-11774	CR-CNS-2012-00661	CR-CNS-2012-00996
CR-CNS-2012-01764			

Section 4OA2: Identification and Resolution of Problems

CONDITION REPORTS

CR-CNS-2009-05746 CR-CNS-2009-05845 CR-CNS-2010-05294 CR-CNS-2012-03039
CR-CNS-2012-03116 CR-CNS-2012-06427

Section 4OA5: Other Activities – Temporary Instruction 2515/185

MISCELLANEOUS DOCUMENTS

	TITLE	DATE
	Potential Sources of Tritium Based On Precipitation Monitoring Network Samples and Meteorology at Cooper Nuclear Station	February 2011
Volume IV Section 5.3.3	USAR, "Diesel Generator Reliability Assurance"	August 23, 2011
3.8.3 E.1	Technical Specification Bases, "Diesel Fuel Oil, Lube Oil, and Starting Air"	August 23, 2011
11-072	NEDC, "DGSA Accumulator Sizing Basis"	0

PROCEDURES

NUMBER	TITLE	REVISION
8.ENV.3	Action Levels for Environmental Samples	1
8.ENV.9	Ground Water Monitoring Program Sampling, Monitoring, and Administrative Requirements	6
8.ENV.10	CNS Precipitation Monitoring	1
9.EN-RP-113	Response to Contaminated Spills/Leaks	3

CONDITION REPORTS

CR-CNS-2009-03669 CR-CNS-2010-05294 CR-CNS-2011-10773 CR-CNS-2012-03039

The following items are requested for the
Occupational Radiation Safety Inspection at

Cooper Nuclear Station
April 9–April 13, 2012

Integrated Report 2012003

Inspection area is Occupational ALARA Planning and Controls (71124.02, 71124.04) and TI 2515/185.

Please provide the requested information in Sections C, D, E, and F for Regional Inspectors' review by March 26, 2012. Other sections may be requested on a case-by-case basis. Please provide the balance of the information by April 9, 2012. Thank you for your support.

NOTE: In an effort to keep the requested information organized, please submit this information to us using the same lettering system below. For example, all contacts and phone numbers for the above inspector should be in a file/folder titled 1-A, Applicable organization charts in file/folder 1-B, etc.

If you have any questions or comments, please contact me at (817) 200-1547 or e-mail me at casey.alldredge@nrc.gov.

PAPERWORK REDUCTION ACT STATEMENT

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

1. Occupational ALARA Planning and Controls (71124.02) to be reviewed by Louis Carson

A. List of contacts and telephone numbers for the following areas:
   1 ALARA Planning
   2 Radiation protection organization

B. Applicable organization charts

C. Copies of audits, self-assessments, surveillances, vendor or NUPIC audits for contractor support and LERs, written since March 25, 2011, related to:
   1 ALARA
   2 Electronic dosimeter alarms
   3 Teledosimetry

D. Procedure index for:
   1 ALARA Program

E. Please provide specific procedures related to the following areas. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
   1 RP Program Description
   2 ALARA Program
   3 ALARA Committee
   4 Radiation Work Permit Preparation

F. A summary list of corrective action documents (including corporate and subtiered systems) written since March 25, 2011, related to the ALARA program including:
   1 Radiation Work Permit violations
   2 Electronic Dosimeter Alarms
   3 RWP Dose Estimates

   NOTE: The lists should indicate the <u>significance level</u> of each issue and the <u>search criteria</u> used. Please provide document which are "searchable."

G Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)

H Most recent refuel outage report

I List of work activities, greater than 1 rem, since March 25, 2011.
Include <u>original</u> dose estimate and actual dose. (Include this item if it was not included in the outage report or if no outage report was published.)

J List of active radiation work permits

K Outline of source term reduction strategy

2. Occupational Dose Assessment (Inspection Procedure 71124.04) to be reviewed by Casey Alldredge

A List of contacts and telephone numbers for the following areas:
1 Radiological effluent control
2 Engineered safety feature air cleaning systems

B Applicable organization charts

C Audits, self assessments, surveillances, vendor or NUPIC audits of contractor support, and LERs written since September 3, 2010, related to:
1. Occupational Dose Assessment

D Procedure indexes for the following areas
1. Occupational Dose Assessment

E Please provide specific procedures related to the following areas. Additional Specific Procedures may be requested after the inspector reviews the procedure indexes.
1. Radiation Protection Program
2. Radiation Protection Conduct of Operations
3. Personnel Dosimetry Program
4. Radiological Posting and Warning Devices
5. Air Sample Analysis
6. Performance of High Exposure Work
7. Declared Pregnant Worker
8. Bioassay Program

F List of corrective action documents (including corporate and subtiered systems) written since September 3, 2010, associated with:
1. NVLAP accreditation
2. Dosimetry (TLD/OSL, etc.) problems
3. Electronic alarming dosimeters
4. Bioassays or internally deposited radionuclides or internal dose
5. Neutron dose

NOTE: The lists should indicate the <u>significance level</u> of each issue and the <u>search criteria</u> used.

G List of positive whole body counts since September 3, 2010, names redacted if desired

H Part 61 analyses/scaling factors

I The most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report on the licensee or dosimetry vendor, as appropriate

3. Temporary Instruction (TI 2515/185) to be reviewed by Casey Alldredge

A An update of NEI 07-07 "Industrial Ground Water Protection Initiative – Final Guidance Document" Objective 1.1 since May 11, 2009.

B An update of NEI 07-07 "Industrial Ground Water Protection Initiative – Final Guidance Document" Objective 1.2 since May 11, 2009.

C An update of NEI 07--07 "Industrial Ground Water Protection Initiative – Final Guidance Document" Objective 1.4 since May 11, 2009.

D An update of NEI 07-07 "Industrial Ground Water Protection Initiative – Final Guidance Document" Objective 2.4 since May 11, 2009.