UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

October 3, 2016

Mr. Richard Michael Glover
Site Vice President
H.B. Robinson Steam Electric Plant
Duke Energy
3581 West Entrance Road, RNPA01
Hartsville, SC 29550

SUBJECT: H.B. ROBINSON STEAM ELECTRIC PLANT - NRC COMPONENT DESIGN BASES INSPECTION REPORT 05000261/2016008

Dear Mr. Glover:

On August 19, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your H. B. Robinson Steam Electric Plant, Unit 2, and discussed the results of this inspection with Mr. J. Krakuszeski and other members of your staff. Additional inspection results were discussed with Mr. J. Krakuszeski and other members of your staff on September 21, 2016. The results of this inspection are documented in the enclosed inspection report.

NRC inspectors documented four findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. The NRC is treating these violations as a non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

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

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

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

Sincerely,

/RA/

Jonathan H. Bartley, Chief
Engineering Branch 1
Division of Reactor Safety

Docket No.: 05000261
License No.: DPR-23

Enclosure:
Inspection Report 05000261/2016008
w/ Attachment: Supplementary Information

cc: Distribution via Listserv

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-261
License No.:	DPR-23
Report No.:	05000261/2016008
Licensee:	Duke Energy Progress, Inc.
Facility:	H. B. Robinson Steam Electric Plant
Location:	3581 West Entrance Road Hartsville, SC 29550
Dates:	July 18, 2016 – August 19, 2016
Inspectors:	G. Ottenberg, Senior Reactor Inspector (Lead) S. Herrick, Reactor Inspector T. Su, Reactor Inspector R. Cureton, Resident Inspector, McGuire Nuclear Station R. Waters, Contractor (Mechanical) O. Mazzoni, Contractor (Electrical)
Approved by:	Jonathan Bartley, Branch Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY

IR 05000261/2016008; 07/18/2016 – 08/19/2016; H. B. Robinson Steam Electric Plant, Unit 2; Component Design Bases Inspection.

This inspection was conducted by a team of three Nuclear Regulatory Commission (NRC) inspectors from Region II, one resident inspector, and two NRC contract personnel. Four Green non-cited violations (NCVs) were identified. The significance of inspection findings is indicated by their color (Green, White, Yellow, Red) using the NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green. The NRC identified a non-cited violation of Technical Specification 5.4.1 for the licensee's failure to maintain emergency operating procedure (EOP) FRP-H.1, "Response to Loss of Secondary Heat Sink," in accordance with their commitment to implement EOPs based on plant specific technical guidelines. Specifically, the licensee was committed to upgrading their EOPs in accordance with the H.B. Robinson Unit 2 plant specific technical guidelines, and FRP-H.1 was not updated during implementation of engineering change (EC) 283171. In response, the licensee entered the issue into their corrective action program as action request 2047575 and updated FRP-H.1 to bring it into conformance with its basis document.

This performance deficiency was more than minor because it could lead to a more significant safety concern if left uncorrected. Specifically, the procedure would have been implemented as written during an event that required bleed and feed, and it was not demonstrated that one SI pump was adequate for core cooling. The finding required a detailed risk evaluation to be performed because the finding was not a deficiency affecting the design of a mitigating structure, system, or component (SSC), and the finding would represent a loss of system and/or function, because it was not demonstrated that one safety injection (SI) pump would be sufficient during bleed and feed operations. A detailed risk assessment determined the increase in core damage frequency due to the performance deficiency was less than1E-6/year, a GREEN finding of very low safety significance. The team determined that the finding was indicative of current licensee performance, because the issue resulted from inadequate implementation of EC 283171, which was completed in 2014. A cross-cutting aspect of Teamwork [H.4.] in the Human Performance area was assigned because individuals and work groups did not communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. (Section 1R21.2)

Green. The NRC identified a non-cited violation of Title 10 Code of Federal Regulations (10 CFR) Part 50.63, "Loss of all alternating current power," for the licensee's failure to meet their commitment to the guidance in NRC RG 1.155, "Station Blackout." Specifically, the licensee's preventive maintenance and testing program did not identify required tests and inspections, and was not implemented such that it demonstrated system readiness and reliability requirements would be met as required by RG 1.155. In response, the licensee entered the issue into their

corrective action program as action request 2053938, and initiated actions to determine which vendor recommended activities were needed to be performed to meet their RG 1.155 commitments and began updating their PM schedule and maintenance procedures.

This performance deficiency was more than minor because it could lead to a more significant safety concern if left uncorrected. Specifically, transformer components degrade over time, and in the absence of appropriate testing and maintenance, could degrade to the point where the transformer may fail when called upon to mitigate an SBO. The team determined the finding to be of very low safety significance (Green) because the finding was a deficiency affecting the design or qualification of a mitigating structure, system, or component (SSC), and the SSC maintained its operability or functionality. The team determined that the finding was indicative of current licensee performance, because AR 643531 was written on November 11, 2013, which described that appropriate maintenance and testing was not being performed on the DS transformer, however, the impact on the station's RG 1.155 commitments was not evaluated. A cross-cutting aspect of Evaluation [P.2] in the Problem Identification and Resolution area was assigned because the licensee did not thoroughly evaluate the issue to ensure that the resolution addressed the cause and extent of condition commensurate with its safety significance. (Section 1R21.2)

Cornerstone: Emergency Preparedness

Green. The NRC identified a non-cited violation of Technical Specification (TS) 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," for the licensee's failure to maintain the operability of the containment radiation monitors (high range) (CHRRMs). In response to this issue, the licensee generated AR 2062735 and made appropriate staff aware of the expected radiation monitor response and re-evaluated the IDO/PDO in NCR 2052758, and determined the CHRRMs were inoperable, and entered the appropriate TS action statement.

This performance deficiency was determined to be more than minor because it was associated with the Facilities and Equipment attribute of the Emergency Preparedness Cornerstone and adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The team determined the finding was of very low safety significance (Green) using the flowchart in IMC 0609, App. B, Attachment 2, because the finding was a failure to comply with a non-risk significant planning standard and no planning standard function failure occurred since other parameters could be used to validate the indications from the CHRRMs. This finding was not assigned a cross-cutting aspect because the issue was not indicative of current licensee performance. Specifically, the failure to properly evaluate the operability implications of IN 97-45 on the Robinson's CHRRMs occurred in 1997 and 1998. (Section 1R21.3)

Green. The NRC identified a non-cited violation of Title 10 Code of Federal Regulations (10 CFR) 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow their operability determination procedure. Specifically, the licensee did not provide a high degree of assurance of operability in their immediate determination of operability (IDO) and did not perform a prompt determination of operability (PDO) as required when evaluating the operability of the containment radiation monitors (high range) (CHRRMs). In response to this issue, the licensee entered the issue into their corrective action program as AR

2055160, re-evaluated the IDO in NCR 2052758, and performed a detailed determination of operability in a PDO as required by their procedure.

This performance deficiency was more than minor because it was associated with the Facilities and Equipment Attribute of the Emergency Preparedness Cornerstone, and adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, an inadequate operability determination regarding the CHRRMs would adversely impact the licensee's ability to classify, assess, and develop the correct protective measures following an accident. The team determined the finding was of very low safety significance (Green) using the flowchart in IMC 0609, App. B, Attachment 2, because the finding resulted in a failure to comply with a non-risk significant planning standard and no planning standard function failure occurred. Specifically, failure to follow the operability determination procedure and adequately determine the operability of the CHRRMs resulted in the failure to provide and maintain adequate emergency equipment that supports the emergency response, however, no failure of the planning standard occurred because other parameters could be used to validate the indications from the CHRRMs. The team determined that the finding was indicative of current licensee performance, because the issue resulted from inadequate implementation of the licensee's operability determination process during the course of the inspection. A cross-cutting aspect of Operating Experience [P.5.] in the Problem Identification and Resolution Area was assigned because the organization did not systematically and effectively collect, evaluate, and implement relevant internal and external operating experience (OE) in a timely manner. (Section 1R21.3)

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R21 Component Design Bases Inspection (71111.21)

.1 Inspection Sample Selection Process

The team selected risk-significant components and related operator actions for review using information contained in the licensee's probabilistic risk assessment. In general, this included components and operator actions that had a risk achievement worth factor greater than 1.3 or Birnbaum value greater than 1E-6. The sample included 13 components, one of which was associated with containment large early release frequency (LERF), and five operating experience (OE) items.

The team performed a margin assessment and a detailed review of the selected risk-significant components and associated operator actions to verify that the design bases had been correctly implemented and maintained. Where possible, this margin was determined by the review of the design basis and Updated Final Safety Analysis Report (UFSAR) response times associated with operator actions. This margin assessment also considered original design issues, margin reductions due to modifications, or margin reductions identified as a result of material condition issues. Equipment reliability issues were also considered in the selection of components for a detailed review. These reliability issues included items related to failed performance test results, significant corrective action, repeated maintenance, maintenance rule status, Manual Chapter 0326 conditions, NRC resident inspector input regarding problem equipment, system health reports, industry OE, and licensee problem equipment lists. Consideration was also given to the uniqueness and complexity of the design, OE, and the available defense-in-depth margins. An overall summary of the reviews performed and the specific inspection findings identified is included in the following sections of the report.

.2 Component Reviews

a. Inspection Scope

Components

- Pressurizer PORV Block Valves [RC-535 & RC-536]
- Diesel Driven Fire Pump [DSL-FIRE-PMP]
- AFW Header Discharge to Steam Generator A/B/C Valves [AFW-V2-16A, AFW-V2-16B, & AFW-V2-16C]
- Boron Injection Tank (BIT) Outlet Valves [SI-870A & SI-870B]
- HVH Safety Injection Pump Area Cooling Units [HVH-6A & HVH-6B]
- Vital Inverter B [Inverter-B]
- Instrument Buses 3 & 8 [INST-3 & INST-8]
- Reactor Trip System [System 1080]
- Station Service Transformers (SSTs) [SST-2G & SST-2F]
- 4kV Bus 3 SST 2C & 2G Supply Breaker [52/15] and 4kV Bus 2 SST 2A & 2F Supply Breaker [52/13]

- Dedicated Shutdown (DS) 4160V/480V Transformer [DSS-MAIN-XFMR]
- Emergency Diesel Generator (EDG) Fuel Oil System [System 5100]

Components with LERF Implications

- Pressurizer Power Operated Relief Valves (PORVs) [RC-PCV-455C & RC-PCV-456]

For the 13 components listed above, the team reviewed the plant technical specifications (TS), UFSAR, design bases documents (DBDs), and drawings to establish an overall understanding of the design bases of the components. Applicable design calculations and procedures were reviewed to verify that the design and licensing bases had been appropriately translated into these documents. Test procedures and recent test results were reviewed against DBDs to verify that acceptance criteria for tested parameters were supported by calculations or other engineering documents, and that individual tests and analyses served to validate component operation under accident conditions. Maintenance procedures were reviewed to ensure components were appropriately included in the licensee's preventive maintenance program. System modifications, vendor documentation, system health reports, preventive and corrective maintenance history, and corrective action program documents were reviewed (as applicable) in order to verify that the performance capability of the component was not negatively impacted, and that potential degradation was monitored or prevented. Maintenance Rule information was reviewed to verify that the component was properly scoped, and that appropriate preventive maintenance was being performed to justify current Maintenance Rule status. Component walkdowns and interviews were conducted to verify that the installed configurations would support their design and licensing bases functions under accident conditions and had been maintained to be consistent with design assumptions.

Additionally, the team performed the following component-specific reviews:

- The team observed a simulator scenario involving a Large Break loss of coolant accident (LOCA), loss of offsite power and EDG failure to verify the actions for transition to cold leg recirculation could be accomplished by the operators within the time critical action limit.
- The team walked down in-plant operator actions associated with Attachments 1 and 2 of EOP-ES.1.3, Transfer to Cold Leg Recirculation to verify the actions for transition to cold leg recirculation could be accomplished within the time critical action limit.
- The team observed a simulator scenario involving a steam generator tube rupture to verify the actions could be performed by the operator within the time critical action limit.
- The team observed the field actions necessary to align fire water to the steam generators in accordance with FRP-H.1, Loss of Secondary Heat Sink, to verify the necessary equipment was available to accomplish the function.

b. Findings

b.1 Failure to Keep EOP FRP-H.1 in Conformance With Plant Specific Guidelines

Introduction: The NRC identified a Green non-cited violation (NCV) of TS 5.4.1 for the licensee's failure to maintain emergency operating procedure (EOP) FRP-H.1, "Response to Loss of Secondary Heat Sink," in accordance with their commitment to

implement EOPs based on plant specific technical guidelines. Specifically, the licensee was committed to upgrading their EOPs in accordance with the H.B. Robinson Unit 2 (HBR2) plant specific technical guidelines, and FRP-H.1 was not updated during implementation of engineering change (EC) 283171.

Description: NRC Generic Letter (GL) 82-33, "Supplement 1 to NUREG-0737-Requirements for Emergency Response Capability," required in section 7.1.c that the licensee "Upgrade EOPs to be consistent with Technical Guidelines and an appropriate procedure Writer's Guide." Robinson's commitments to meet these requirements were summarized in an order confirming the licensee's commitments on their emergency response capability dated February 21, 1984. The order stated that the licensee would submit a procedures generation package and implement the upgraded EOPs. In their submittal of the procedures generation package, dated July 2, 1984, the licensee stated that, "The HBR2 specific technical guidelines are based on the Westinghouse Owners Group (WOG) generic technical guidelines."

Robinson's plant specific technical guideline for FRP-H.1 was located in its basis document, FRP-H.1-BD, "Response to Loss of Secondary Heat Sink Basis Document." The inspectors discovered on approximately July 21, 2016, that in 2014, during implementation of EC 283171, "Phase 2 EOP Upgrade," Robinson updated FRP-H.1-BD, to conform to revisions to the WOG guidance for this procedure, however, the associated EOP (FRP-H.1) was inadvertently not updated along with the basis document. Due to this error, the EOP was not maintained to ensure that Robinson's commitments to NUREG-0737 and GL 82-33 were met. Following completion of EC 283171, appropriate guidance for establishing bleed and feed following a loss of secondary heat sink was contained in FRP-H.1-BD, revision 29, but not its associated procedure. The procedure had incorrect guidance concerning the number of safety injection (SI) pumps that were required for the bleed and feed alignment. Specifically, the basis of step 13, "Check RCS Feed Path," (which corresponded to WOG Step 12), stated:

- "If only a high-head SI pump is available, it is possible that adequate bleed and feed cooling may not be established for the quasi-worst case conditions assumed in the loss of heat sink analyses in WCAP-16902-P."
  And

- "Because it cannot be assured that bleed and feed will be successful with only a high-head SI pump, the operator is directed in this step to continue attempts to restore equipment such as a feedwater pump or charging pump instead of initiating bleed and feed when only a high head SI pump is running."

However, FRP-H.1, revision 29, step 13 stated:

- "Check RCS Feed Path: a. CHECK SI Pumps status- ALL RUNNING." The RESPONSE NOT OBTAINED direction for this step was (in part) "a. PERFORM the following…3) IF at least one SI Pump is RUNNING, THEN GO TO Step 14."

Step 14 directed operators to establish the bleed path. Guidance to restore other pumps was not provided in FRP-H.1, if only one SI pump was available, and no plant specific analysis existed to support the appropriateness of only one SI pump. The operator was

directed to establish the bleed path when the feed path had not been shown as being adequate to support the core cooling function when in this alignment.

Analysis. The licensee's failure to maintain EOP FRP-H.1 in accordance with their commitment to implement EOPs based on plant specific technical guidelines, was a performance deficiency and a failure to meet TS 5.4.1. This performance deficiency was more than minor because, if left uncorrected, the performance deficiency could lead to a more significant safety concern. Specifically, the procedure would be implemented as written during an event that required bleed and feed, and it was not demonstrated that one SI pump was adequate for core cooling.

The team used IMC 0609, Att. 4, "Initial Characterization of Findings," issued June 19, 2012, for Mitigating Systems, and IMC 0609, App. A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, and determined the finding required a detailed risk evaluation to be performed because the finding was not a deficiency affecting the design of a mitigating structure, system, or component (SSC), and the finding would represent a loss of system and/or function, because it was not demonstrated that one SI pump would be sufficient during bleed and feed operations. A detailed risk assessment was performed by a regional SRA in accordance with NRC IMC 0609 Appendix A utilizing the NRC Robinson SPAR probabilistic risk assessment (PRA) model. The major analysis assumptions included a one year exposure period and changing the feed and bleed SI acceptance criteria to 2 of 3 SI pumps required. Fire external event risk was assessed with input from the licensee's fire PRA model and seismic and high wind risk was estimated using the NRC Robinson SPAR model. The dominant sequence was a grid related loss of offsite power initiator, successful reactor shutdown, failure of motor-driven, steam-driven and diesel driven auxiliary feedwater and failure of feed and bleed due to the performance deficiency leading to a late core heat removal failure. The risk was limited by the amount of mitigation capability. The increase in core damage frequency due to the performance deficiency was less than 1E-6/year, a GREEN finding of very low safety significance.

The team determined that the finding was indicative of current licensee performance, because the issue resulted from inadequate implementation of EC 283171, which was completed in 2014. A cross-cutting aspect of Teamwork [H.4.] in the Human Performance area was assigned because individuals and work groups did not communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. Specifically, the licensee did not communicate and coordinate their activities sufficiently, such that the procedure was updated as intended by the EC, which resulted in EOP FRP-H.1 not conforming to its basis document.

Enforcement. Technical Specification 5.4.1, required, in part, that "Written procedures shall be established, implemented, and maintained covering the following activities: (b) The emergency operating procedures required to implement the commitments to NUREG-0737, and of NUREG-0737, Supplement 1, as stated in Generic Letter 82-33." Contrary to the above, since 2014, following implementation of EC 283171, the licensee did not establish, implement, and maintain EOP FRP-H.1, such that the commitments to NUREG-0737, and NUREG-0737, Supplement 1 as stated in GL 82-33 were met. Specifically, the licensee committed to meeting the HBR2 specific technical guidelines, based on the WOG generic technical guidelines, but did not incorporate changes necessary to make EOP FRP-H.1 conforming to its basis document. In response to this

issue, the licensee updated FRP-H.1 to bring it into conformance with its basis document. This violation is being treated as an NCV consistent with section 2.3.2.a. of the Enforcement Policy. The violation was entered into the licensee's corrective action program as action request (AR) 2047575. (NCV 05000261/2016008-01, "Failure to Keep EOP FRP-H.1 in Conformance with Plant Specific Guidelines.")

b.2 Failure to Perform Appropriate Maintenance or Testing for the Dedicated Shutdown (DS) Transformer

Introduction: The NRC identified a Green NCV of Title 10 Code of Federal Regulations (10 CFR) Part 50.63, "Loss of all alternating current power," for the licensee's failure to meet their commitment to the guidance in NRC Regulatory Guide (RG) 1.155, "Station Blackout." Specifically, the licensee's preventive maintenance and testing program did not identify required tests and inspections, and was not implemented such that it demonstrated system readiness and reliability requirements would be met as required by RG 1.155.

Description: The dedicated shutdown transformer (DST) is part of the dedicated shutdown diesel generator (DSDG) system at Robinson, and is used in the power path from the DSDG to the DS buses. The DS buses provide power to equipment necessary to ensure safe shutdown conditions can be maintained following a station blackout (SBO) event. The DSDG system is a non-safety related system credited as the alternate alternating current (AAC) power system used to cope with the conditions caused by an SBO. The licensee committed to meeting RG 1.155 in order to meet the requirements of 10 CFR 50.63, in the Robinson UFSAR, section 1.8, which stated, "HBR2 complies with the intent of NRC Regulatory Guide 1.155. In developing the Station Blackout (SBO) Coping Analysis (Document 8S19-P-101), the guidance of NUMARC 87-00 has been applied... The analytical method applied and the results of these analyses are documented in SBO Coping Analysis 8S19-P-101."

NRC RG 1.155, Regulatory Position 3.3.5, stated, "The AAC power system should be inspected, maintained, and tested periodically to demonstrate operability and reliability." Appendix A to RG 1.155 established the quality assurance requirements to be applied to non-safety related equipment used to meet the requirements of the SBO rule, and stated:

- 5. Testing and Test Control- A test program should be established and implemented to ensure that testing is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. The tests should be performed in accordance with written test procedures; test results should be properly evaluated and acted on.
- 6. Inspection, Test, and Operating Status- Measures should be established to identify items that have satisfactorily passed required tests and inspections.

The guidance in NUMARC 87-00 was endorsed in NRC RG 1.155, and Regulatory Position 3.3.5 of RG 1.155 was cross referenced, in part, to Appendix B of NUMARC 87-00. In part, NUMARC 87-00, Appendix B, required, "Unless otherwise governed by technical specifications, surveillance and maintenance procedures for the AAC system shall be implemented considering the manufacturer's recommendations or in accordance with plant developed procedures."

Robinson's SBO coping analysis (8S19-P-101) stated, in section 4.2.2.1, "Conformance with NUMARC 87-00 Requirements," that, "To provide confidence in the availability of non-class 1E equipment during SBO, maintenance management manuals, operation surveillance test procedures, preventive maintenance procedures and corrective maintenance procedures have been put into effect for the DSDG system and other Appendix R related equipment that are relied upon to function during SBO." Additionally, Robinson calculation 8S19-P-100, "Conformance of the Dedicated Shutdown Diesel Generator System with the Alternate AC Power Criteria," stated, "The non-Class 1E equipment that is required to function at RNP, such as the DSDG system, have maintenance programs and procedures that follow the criteria specified in the Maintenance Management Manuals and the vendor manuals. Periodic inspection and preventive maintenance are performed and records of maintenance activities are maintained. The existing programs and procedures provide an acceptable confidence in the availability of the non-Class 1E equipment during SBO."

On approximately August 15, 2016, the NRC became aware that the licensee did not have a vendor manual or a set of vendor instructions for the DST. Prior to the NRC asking about the vendor instructions, the licensee identified the need to perform regular maintenance and surveillance on the DST in 2013, when they generated AR 643531. However, the licensee did not identify the required testing and surveillance activities that were necessary to demonstrate that system readiness and reliability requirements would be met, as recommended by the transformer manufacturer. The licensee only generated actions to perform Doble testing on the DST as a result of AR 643531. This was due in part to the licensee not recognizing that performance of maintenance and surveillance activities were required to meet their commitments to RG 1.155 and NUMARC 87-00. The licensee did not include, as corrective actions to AR 643531, the necessary steps conducive to appropriate maintenance and surveillance. For example, the vendor recommended the following to be performed annually, and these activities were not being performed:

- Determine that the oil has a dielectric strength of more than 26KV
- Check and clean bushings
- Make megger check or power factor check of insulation and bushings for comparison with previous observations.

After obtaining a vendor manual from the DST manufacturer, the licensee determined that some of the vendor's other recommendations were being performed, however, the licensee had not been conducting meaningful recording of the readings from the transformer monitoring devices, and so trending of the transformer condition had not been established, nor were meaningful records being maintained. The team determined that the lack of an appropriate testing or preventive maintenance program had not resulted in previous failures of the DST. However, operating experience has demonstrated that transformer components degrade over time, and in the absence of appropriate testing and maintenance, could degrade to the point where the transformer may fail when called upon. The DST had been in service since 1980.

Analysis. The licensee's failure to identify required tests and inspections, and failure to implement a preventive maintenance and testing program such that it demonstrated system readiness and reliability requirements for the DS transformer would be met, as required by RG 1.155, was a performance deficiency and a failure to meet 10 CFR 50.63, "Loss of all alternating current power." The licensee's failure to demonstrate that

the equipment relied upon in the SBO coping analysis was adequate resulted in an inappropriate coping analysis. This performance deficiency was more than minor because it could lead to a more significant safety concern if left uncorrected. Specifically, transformer components degrade over time, and in the absence of appropriate testing and maintenance, could degrade to the point where the transformer may fail when called upon to mitigate an SBO.

The team used IMC 0609, Att. 4, "Initial Characterization of Findings," issued June 19, 2012, for Mitigating Systems, and IMC 0609, App. A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, and determined the finding to be of very low safety significance (Green) because the finding was a deficiency affecting the design or qualification of a mitigating SSC, and the SSC maintained its operability or functionality.

The team determined that the finding was indicative of current licensee performance, because AR 643531 was written on November 11, 2013, which described that appropriate maintenance and testing was not being performed on the DS transformer, however, the impact on the station's RG 1.155 commitments was not evaluated. A cross-cutting aspect of Evaluation [P.2] in the Problem Identification and Resolution area was assigned because the licensee did not thoroughly evaluate the issue to ensure that the resolution addressed the cause and extent of condition commensurate with its safety significance. Specifically, the licensee did not evaluate the issue described in AR 643531 such that its resolution addressed the non-conformance to RG 1.155.

Enforcement. Title 10 CFR 50.63(a)(2), required, in part, that, "The capability for coping with a station blackout of specified duration shall be determined by an appropriate coping analysis." The adequacy of the coping analysis depended on the quality assurance requirements applied to the (non-safety related) DS equipment as described in RG 1.155. Contrary to the above, prior to the inspection, the licensee did not determine that the station was capable of coping with a station blackout by an appropriate coping analysis. Specifically, the licensee was committed to meeting NRC RG 1.155 in section 1.8 of their UFSAR. NRC RG 1.155, Regulatory Position 3.3.5, stated, "The AAC power system should be inspected, maintained, and tested periodically to demonstrate operability and reliability." Additionally, NRC RG 1.155, Appendix A required that, "A test program should be established and implemented to ensure that testing is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements," and that, "Measures should be established to identify items that have satisfactorily passed required tests and inspections." The licensee was not performing appropriate maintenance or testing which demonstrated that the DS transformer would be in conformance with its readiness and reliability requirements, and did not identify required tests and inspections. In response to this issue, the licensee initiated actions to determine which vendor recommended activities were needed to be performed to meet their RG 1.155 commitments and began updating their PM schedule and maintenance procedures. This violation is being treated as an NCV consistent with section 2.3.2.a. of the Enforcement Policy. The violation was entered into the licensee's corrective action program as AR 2053938. (NCV 05000261/2016008-02, "Failure to Perform Appropriate Maintenance or Testing for the Dedicated Shutdown Transformer.")

.3 Operating Experience

a. Inspection Scope

The team reviewed five operating experience issues for applicability at the H. B Robinson Steam Electric Plant. The team performed an independent review of these issues and, where applicable, assessed the licensee's evaluation and dispositioning of each item. The issues that received a detailed review by the team included:

- NRC Information Notice (IN) 1994-24, Inadequate Maintenance of Uninterruptible Power Supplies and Inverters
- NRC IN 1997-45, Environmental Qualification Deficiency for Cables and Containment Penetration Pigtails
- NRC IN 2010-27, Ventilation System Preventive Maintenance and Design Issues
- NRC IN 2007-34, Operating Experience Regarding Electrical Circuit Breakers
- NRC IN 2012-01, Seismic Considerations- Principally Issues Involving Tanks

b. Findings

b.1 Failure to Comply with TS Requirements for Containment High Range Radiation Monitors

Introduction: The NRC identified a Green NCV of TS 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," for the licensee's failure to maintain the operability of the containment radiation monitors (high range) (CHRRMs).

Description: Robinson's CHRRMs are used in the emergency plan for emergency classification and accident assessment. In 1997, the US NRC issued Information Notice (IN) 97-45 concerning the potential for moisture intrusion into the cables of CHRRMs, as was discovered by Southern California Edison (SCE) at San Onofre Nuclear Generating Station (SONGS). The CHRRMs at SONGS were determined to be affected by environmental factors (temperature, air flow, electronic noise, moisture, etc.) and the cables associated with the CHRRMs were tested to reassess the environmental qualification of the signal cables in containment. As a result of the test, SCE concluded that moisture could permeate the cable jacket during a design basis accident and cause partial shorting of the radiation monitor signal, causing erroneous or erratic readings, or a complete failure of CHRRM indication in the control room. Effects on the detector response due to moisture intrusion was determined to be caused, at least in part, by the difference in elevation between the containment penetrations and CHRRMs which could provide a pressure head on water that collected within the cable. The information notice further notified licensees that this same condition may exist in other monitoring system applications and may exist in other safety-related equipment applications. In 1998, the US NRC issued Supplement 1 to the information notice which notified licensees that an additional separate and independent mechanism had been identified by which temperature-induced phenomena could provide false indication during an accident inside containment.

The Robinson TS Bases document, section 3.3.3, stated that, "Containment Area Radiation is provided to monitor for the potential of significant radiation releases and to

provide release assessment for use by operators in determining the need to invoke site emergency plans. Containment radiation level is used to determine the type of high energy line break (HELB) that has occurred inside containment." Additionally, the Robinson UFSAR stated, in subsection 12.3.3.1.2.2, that, "The Post Accident Containment Radiation Monitoring System is designed to provide measurement of containment radiation exposure levels during an accident to help assess the severity of the accident." It further stated that, "The monitors and associated equipment are qualified for *continuous* post-accident operation" (emphasis added).

In 1997, the licensee evaluated the original issuance of IN 97-45 using procedure PLP-107, "Operating Experience Program," revision 0, and documented the results in OE 6539. Robinson's procedure PLP-107 stated in section 8.2.1, that, "The purpose of the evaluation is to determine the implications of the occurrence and to recommend corrective actions as necessary which should reduce the probability of similar events from occurring at HBRSEP." The evaluation documented in OE 6539 did not identify that the Robinson CHRRMs, R-32A and R-32B, utilized the cabling that was described in IN 97-45, and therefore did not conclude they were potentially affected. A subsequent evaluation of IN 97-45, performed in response to the supplement to IN 97-45, was documented in OE 6992 and concluded that the Robinson CHRRMs did contain the cabling in question, and that the CHRRMs were susceptible to the same temperature induced-phenomena as SONGS, as described in IN 97-45, during the first 15 minutes following a LOCA or HELB inside containment. After the OE review identified the CHRRMs could be adversely affected by the phenomena described, Robinson generated AR 00010531 to document the issue.

On approximately August 10, 2016, the inspectors became aware that no formal operability determination was documented in AR 00010531, and that Robinson failed to adequately consider the effects of the phenomena outlined in IN-97-45 and its supplement, and their effect on the operability of the CHRRMs, or the CHRRMs conformance to the functional description of the equipment in the UFSAR. The AR had been closed without corrective action being taken, because, as documented in the AR, other "corroborating data would be used to confirm the readings provided by these containment high range detectors," therefore no plans to address the expected inaccurate detector response were made. The licensee did not recognize that using "corroborating data" to support operability of the CHRRMs did not mean the CHRRMs themselves could meet the UFSAR described functional requirements of providing measurement of containment radiation exposure levels during an accident, nor did it mean they could meet the technical specification bases description of being able to monitor for the potential of significant radiation releases. Specifically, if the detectors were to indicate a much higher or much lower radiation level than is actually present in containment, the detectors would not provide measurement of the containment radiation exposure levels during the accident to help assess the severity of an accident, nor would they monitor for the potential of significant radiation releases, as described in the UFSAR and the technical specification bases, respectively.

After the inspectors made the licensee aware of the issues with their original evaluations of IN 97-45 and its supplement, the licensee generated AR 2052758, and performed a follow-up immediate and prompt determination of operability of the CHRRMs. The licensee's engineering evaluation that was performed in support of the operability evaluation determined that one of the CHRRM channels required by TS could read high enough for a short period of time following an accident in containment to require a

general emergency classification, should the indication be used directly, and that the other channel would also read significantly higher than expected. The licensee ultimately concluded they did not have adequate justification for reasonable assurance of operability of the CHRRMs, and entered the appropriate TS action statement. Additionally, the licensee generated AR 2062735 to capture the violation.

Analysis: The licensee's failure to maintain the operability of the R-32A/B containment high-range radiation monitors as required by TS was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Facilities and Equipment attribute of the Emergency Preparedness Cornerstone and adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency.

The team used IMC 0609, Att. 4, "Initial Characterization of Findings," issued June 19, 2012, for the Emergency Preparedness cornerstone, and IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," issued September 22, 2015, and determined the finding was of very low safety significance (Green) using the flowchart in IMC 0609, App. B, Attachment 2, because the finding was a failure to comply with a non-risk significant planning standard and no planning standard function failure occurred since other parameters could be used to validate the indications from the CHRRMs. This finding was not assigned a cross-cutting aspect because the issue was not indicative of current licensee performance. Specifically, the failure to properly evaluate the operability implications of IN 97-45 on the Robinson's CHRRMs occurred in 1997 and 1998.

Enforcement: Technical Specification 3.3.3, Post Accident Monitoring (PAM) Instrumentation, required two channels of Containment Area Radiation (High Range) detectors to be operable when the unit is in Modes 1, 2, or 3. It also required, for one or more Functions with two required channels inoperable, that one of the required channels be restored to Operable within 7 days or Initiate action in accordance with Specification 5.6.6. Specification 5.6.6 required that a PAM Instrumentation Report be submitted within 14 days that outlined the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to Operable status. Contrary to the above, since 1997, the licensee failed to restore at least one channel of CHRRM to operable status, initiate the preplanned alternate method of monitoring the appropriate parameter, or prepare and submit a PAM Instrumentation Report to the Commission within 14 days pursuant to Specification 5.6.6. Specifically, the licensee failed to provide reasonable assurance that the CHRRMs would provide measurement of containment radiation exposure levels during an accident in containment to help assess the severity of the accident. In response to this issue, the licensee made appropriate staff aware of the expected radiation monitor response and re-evaluated the IDO/PDO in AR 2052758, and determined the CHRRMs were inoperable, and entered the appropriate TS action statement. This violation is being treated as an NCV consistent with section 2.3.2.a. of the Enforcement Policy. The violation was entered into the licensee's corrective action program as AR 2062735. (NCV 05000261/2016008-03, Failure to Comply with TS Requirements for Containment High Range Radiation Monitors.)

b.2 Failure to Follow Operability Determination Process

Introduction: The NRC identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow their operability determination procedure. Specifically, the licensee did not provide a high degree of assurance of operability in their immediate determination of operability (IDO) and did not perform a prompt determination of operability (PDO) as required when evaluating the operability of the containment radiation monitors (high range) (CHRRMs).

Description: Robinson's CHRRMs are used in the emergency plan for emergency classification and accident assessment, and were the topic of IN 97-45, "Environmental Qualification Deficiency for Cables and Containment Penetration Pigtails," and its supplement. During the team's review of the licensee's original evaluations of IN 97-45 and its supplement, it was determined that a formal operability determination was not previously documented. In response to the team's question on the basis for operability of the CHRRMs, the licensee generated AR 2052758 to document potential deficiencies with their original evaluations and performed an IDO. In determining the operability of the CHRRMs, which were required to be operable by TS 3.3.3, "Post Accident Monitoring (PAM) instrumentation," the licensee failed to follow the guidance in AD-OP-ALL-0105, "Operability Determinations and Functionality Assessments," revision 2, which was the active procedure directing the performance of operability determinations at the time of the inspection. Specifically, section 5.4, "Immediate Determination of Operability (IDO)," subsection 5.4.1, "Standards," required:

- 3. The supporting basis for the reasonable expectation of SSC operability must provide a high degree of confidence that the SSC remains Operable. a. The standard of reasonable expectation is a high standard and there is no such thing as an indeterminate state of Operability; an SSC is either Operable or Inoperable.

On approximately August 18, 2016, the inspectors became aware that the licensee did not provide a high degree of confidence that the SSC remained operable. Specifically, the licensee's documented basis for reasonable assurance of operability was, "R-32A/B currently meet the EQ requirements specified by 10 CFR 50.49. The issue is based on a plant specific OE and has not presented itself at RNP." The inability of this particular equipment to meet the environmental (EQ) requirements of 10 CFR 50.49 was the topic of IN 97-45 and its supplement. The licensee had not discussed why the potential impacts on the equipment discussed in IN 97-45 would not affect Robinson's CHRRMs or their ability to read accurately post-accident, and therefore did not provide a high degree of confidence that the CHRRMs remained operable for performing their functions described in the TS bases document and the UFSAR.

Additionally, section 5.5, "Prompt Determination of Operability (PDO)," subsection 5.5.1, "Standards," required:

- 1. Circumstances requiring a PDO include: a. The IDO relies on assumptions that have not been justified and additional information could negate a previous determination that there is a reasonable expectation of Operability…c. Additional information such as supporting analysis, or vendor research is needed to confirm the IDO.

The licensee assumed, without justification, that the Robinson CHRRMs would not be affected by the environmental effects described in IN 97-45, and a PDO was not performed, or requested to be performed. Additional research was needed to confirm the conclusion of the IDO. A PDO was later performed in response to the inspection team's questioning. On September 19, 2016, the CHRRMs were declared inoperable.

Analysis. The team determined that the licensee's failure to follow procedure AD-OP-ALL-0105 when performing the operability determination for the issue discussed in AR 2052758, was a performance deficiency and a failure to meet 10 CFR 50, Appendix B, Criterion V. Performing operability determinations is an activity affecting quality, and the licensee did not perform the activity in accordance with their procedure. This performance deficiency was more than minor because it was associated with the Facilities and Equipment Attribute of the Emergency Preparedness Cornerstone, and adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, an inadequate operability determination regarding the CHRRMs would adversely impact the licensee's ability to classify, assess, and develop the correct protective measures following an accident.

The team used IMC 0609, Att. 4, "Initial Characterization of Findings," issued June 19, 2012, for the Emergency Preparedness cornerstone, and IMC 0609, App. B, "Emergency Preparedness Significance Determination Process," issued September 22, 2015, and determined the finding was of very low safety significance (Green) using the flowchart in IMC 0609, App. B, Attachment 2, because the finding resulted in a failure to comply with a non-risk significant planning standard and no planning standard function failure occurred. Specifically, failure to follow the operability determination procedure and adequately determine the operability of the CHRRMs resulted in the failure to provide and maintain adequate emergency equipment that supports the emergency response, however, no failure of the planning standard occurred because other parameters could be used to validate the indications from the CHRRMs.

The team determined that the finding was indicative of current licensee performance, because the issue resulted from inadequate implementation of the licensee's operability determination process during the course of the inspection. A cross-cutting aspect of Operating Experience [P.5.] in the Problem Identification and Resolution Area was assigned because the organization did not systematically and effectively collect, evaluate, and implement relevant internal and external OE in a timely manner. Specifically, the licensee did not effectively collect and evaluate relevant OE information related to the radiation monitor performance associated with IN 97-45 to correctly evaluate the operability of the Robinson CHRRMs, R-32A/B.

Enforcement. Title 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required, in part, that, "Activities affecting quality shall be prescribed by documented instructions, procedures, and drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings." Contrary to the above, on August 10, 2016, upon completion of the IDO in AR 2052758, the licensee did not accomplish an activity affecting quality in accordance with their procedure. Specifically, performing operability determinations is an activity affecting quality, and the licensee did not accomplish this activity in accordance with their procedure, AD-OP-ALL-0105. In response to this issue, the licensee re-evaluated the IDO in AR 2052758, and performed a detailed determination of

operability in a PDO as required by their procedure. This violation is being treated as an NCV consistent with section 2.3.2.a. of the Enforcement Policy. The violation was entered into the licensee's corrective action program as AR 2055160. (NCV 05000261/2016008-04, "Failure to Follow Operability Determination Process.")

4OA6 Meetings, Including Exit

On August 19, 2016, the team presented the inspection results to Mr. J. Krakuszeski and other members of the licensee's staff. Additional inspection results were discussed with Mr. J. Krakuszeski and other members of the licensee's staff on September 21, 2016. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:
D. Nassar, Supervisor, Mechanical/Civil Design Engineering
J. Wild, Senior Nuclear Engineer
K. Beatty, Lead Nuclear Engineer
T. Groch, Sr. Nuclear Engineer
T. Halker, Sr. Nuclear Engineer
B. Hearne, Nuclear Engineer II
A. Helms, Principal Nuclear Engineer
G. Howse, Supervisor Nuclear Maintenance
D. Hunt, Nuclear Engineer III
J. Kulangara, Sr. Nuclear Engineer
N. Mbacke, Nuclear Engineer II
F. Modlin, Lead Nuclear Engineering Technologist
T. Nance, Sr. Nuclear Engineer
C. Nellis, Lead Nuclear Engineer
C. Reed, Nuclear Engineer III
L. Smith, Sr. Operations Specialist
M. Watkins, Senior Nuclear Engineer

NRC personnel
M. Hamm, Office of Nuclear Reactor Regulation
G. Hopper, Chief, Projects Branch 4, Division of Reactor Projects
G. MacDonald, Senior Reactor Analyst, Division of Reactor Projects

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened and Closed

05000261/2016008-01	NCV	Failure to Failure to Keep EOP FRP-H.1 in Conformance with Plant Specific Guidelines [Section 1R21.2]
05000261/2016008-02	NCV	Failure to Perform Appropriate Maintenance or Testing for the Dedicated Shutdown Transformer [Section 1R21.2]
05000261/2016008-03	NCV	Failure to Comply with TS Requirements for Containment High Range Radiation Monitors [Section 1R21.3]
05000261/2016008-04	NCV	Failure to Follow Operability Determination Process [Section 1R21.3]

LIST OF DOCUMENTS REVIEWED

Procedures

2016 Systems Audit- In-Plant JPM I, Align Backup Fuel Oil to the B EDG
731-040-36, Motor Operated Gate Valves, Manually Operated Gate Valves, Swing Check Valves, Rev. 2
AD-DC-ALL-0201, Development and Maintenance of Controlled Procedure Manual Procedures, Rev. 17
AD-EG-ALL-1093 Engineering Quality Review, Rev. 0
AD-EG-ALL-1107 Quality Classifications, Rev. 0
AD-EG-ALL-1202, Preventive Maintenance and Surveillance Testing Administration, Rev. 3
AD-EG-ALL-1203, Preventive Maintenance Template Administration, Rev. 3
AD-EG-ALL-1211, System Performance Monitoring and Trending, Rev. 13
AD-EG-ALL-1213, Systems Walkdowns, Rev. 2
AD-EG-RNP-1213, RNO Specific Requirements for Systems Walkdowns, Rev. 4
AD-OP-ALL-0105, Operability Determination and Functionality Assessments, Rev. 2
AD-OP-ALL-1000 Conduct of Operations, provides the Standards and Expectations for Operator Rounds Log, Rev. 105
AD-PI-ALL-0100, Corrective Action Program, Rev. 5
AOP-005, Radiation Monitoring System, Revs. 33 and 34
AOP-005-BD, Basis Document, Radiation Monitoring System, Rev. 34
AOP-020, Loss of Residual Heat Removal (Shutdown Cooling), Rev. 47
AOP-021, Seismic Disturbances, Rev. 26
AP-019, Malfunction of RCS Pressure Control, Rev. 20
AP-025, Operator Time Critical Action Program, Rev. 1
APP-003, RCS and Makeup Systems, Rev. 54
APP-036, Auxiliary Annunciator, Rev. 90
CM-201, Safety Related and Non-Safety Related Heat Exchanger Maintenance, Rev. 56
CP-001, Chemistry Monitoring Program, Rev. 126
CP-DSL-402, Diesel Fuel Oil Storage Tank Sampling, Rev. 6
EDP-008, Robinson Nuit 2, Administrative Procedure, Instrument Buses, Rev. 34
EDP-011, Dedicated/Shutdown Emergency Lighting Units, Rev. 20
EGR-NGGC-0104, Low Voltage AC and DC Fuse Selection, Rev. 5
EGR-NGGC-0106, AC and DC Overcurrent Protection and Coordination, Rev. 5
EOP-E-0, Reactor Trip or Safety Injection, Rev. 7
EOP-E-1, Loss of Reactor or Secondary Coolant, Rev. 6
EOP-E-3, Steam Generator Tube Rupture, Rev. 10
EOP-ECA-0.0, Loss of All AC Power, Rev. 4
EOP-ES-1.3, Transfer to Cold Leg Recirculation, Rev. 0
EOP-ES-1.3-BD, Transfer to Cold Leg Recirculation Basis Document, Rev. 0
EPP-28, Loss of Ultimate Heat Sink, Rev. 19
FP-012, Fire Protection Systems Minimum Equipment and Compensatory Actions, Rev. 20
FP-013, Fire Protection Systems Surveillance Requirements, Rev. 12
FRP-H.1, Response to Loss of Secondary Heat Sink, Revs. 29 and 30
FRP-H.1-BD, Response to Loss of Secondary Heat Sink Basis Document, Revs. 29 and 30
GP-001, Fill and Vent of the Reactor Coolant System, Rev. 68
IP-0-A-2000-004, Doble Test Procedure, Rev. 21
JPM-CR-007, Align SI System for Cold Leg Recirculation, Rev. 16
JPM-CR-024, Job Performance Measure (Transfer to Long Term Recirculation), Rev. 5
MOD 008, Administrative Procedure, Station Blackout Engineering Screening Capability, Rev. 20

NGG-PMB-XFM-01 Progress Energy PM for Oil Filled Transformers, Rev. 0
OMM-014, Radiation Monitor Setpoints, Rev. 52
OMM-043, Verification and Validation, Rev. 20
OMM-044, Emergency Operating Procedure Program, Rev. 13
OP-006, Pressurizer PORV Pneumatic System/LTOPP, Rev. 43
OP-103, Pressurizer Relief Tank Control System, Rev. 21
OP-602, Dedicated Shut Down System, Rev. 73
OP-909, Fuel oil System, Rev. 55
OP-925, Cold Weather Operation, Rev. 66
OST-013, Weekly Checks and Operations, Rev. 128
OST-910, Procedure for Dedicated Shutdown Diesel Generator (Monthly), Rev. 58
PD-EG-ALL-1200, Equipment Reliability Process, Rev. 2
PLP-017, Operating Experience Program, Rev. 0
PLP-018 Quality Assurance Program for Non-Safety Systems and Equipment Used to Meet the Station Blackout Rule, Rev. 18
PLP-033, Post Maintenance Testing, Rev. 60
PLP-107, Operating Experience Program, Rev. 0
PM-327 Pre-Installation Testing of Non-Appendix R Molded Case Circuit Breaker, Rev. 29
PM-447, Molded Case Circuit Breakers Instantaneous Trip Setting, Rev. 28
PM-450, Molded Case Circuit Breaker Thermal and Instantaneous Trip Testing, Rev. 22
PM-451, Single and Double Pole Thermal-Magnetic Molded Case Circuit Breaker Testing, Rev. 21
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PM-E-GNRL-TOL-RLY-001, Thermal Overload Testing, Rev. 2
RNP-PMB-XFM-01 Basis Report for Oil Immersed Station Type Transformers, Rev. 0
RNR-F/PSA-0014, RNP PRA Model Appendix E- Human Reliability Analysis, Rev. 5
TE-MN-ALL-0202, Transformer and Apparatus Testing, Rev. 0
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DFOST Sample Results, 7/7/16
GP-002, Cold Shutdown to Hot Subcritical at No Load Tavg, Rev. 136, 12/1/15
OST-022, Robinson Nuclear Plant Weekly Surveillance, Dated 7/3/15, 8/7/15, 9/4/15, 10/2/15, 11/6/15, 12/4/15, 1/1/16, 2/5/16, 3/3/16, 4/8/16, and 5/6/16
OST-022, Weekly Surveillances, 7/1/16
OST-151-1, SIS Components Test – Pump A, 4/6/16
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OST-155-2, SI B System Integrity Test, 10/20/15
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OST-201-1, MDAFW System Component Test -Train A, 4/10/16
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TMM-127, Attachment 10.1, Analysis of Category 1 AOV Diagnostic Data, "Sliding Stem Valve with Spring/Diaphragm Actuator Spring to Close Configuration for (RNP-MM/MECH-1721), Rev. 5, 5/27/15 and 5/28/15
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5379-1082, Safety Injection System Flow Diagram, Sht. 5 of 5, Rev. 40
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5379-1878, Valve Drawing SI-870 Sheets 2, 3 and 4, Rev. 0
5379-1971, Reactor Coolant System – Flow Diagram, Sht. 2 of 2, Rev. 53
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G-190200, Instrument & Station Air System Flow Diagram, Sht. 9 of 10, Rev. 26
G-190204D, Fuel Oil System Flow Diagram (Sheets 1-4), Rev. 28
G190626, 480, 120/208 V Single Line Diagram, Rev. 28
G-190626, Sh. 1 of 3, Main & 4160 Volt One Line Diagram, Rev. 10
G190626, Sh. 1, Main and 4160 Volt One Line Diagram, Rev. 10
G190626, Sh. 2, 480 & 120/208 Volt One Line Diagram, Rev. 28
G-190626, Sh. 3, 125V DC & 120V Vital AC One Line Diagram, Rev. 21
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HBR2-11260-SH00001, Zone Map for Environmental Parameters, Rev. 9
HBR2-11260-SH00008, Zone Map for Environmental Parameters, Rev. 16
HBR2-1134 SH0001, Auxiliary Building – EL. 226.00' and EL. 246.00' Post- Fire Operation Routes, Operating Locations and Emergency Lighting Unit Locations, Rev. 13
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00490939	00516624	00521110	00548318
00562327	00589649	00615639	00624061
00635482	00642282	00653654	00710646
00719986	00732201	00744834	00746981
00756536	00757854	01938533	01940558
01943491	01975735	01977018	01998607
02011804	02028541	02034217	05421071

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01048891	01145318-01	1393066-01	1393066
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