



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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August 11, 2017

Mr. Peter A. Gardner
Site Vice President
Monticello Nuclear Generating Plant
Northern States Power Company, Minnesota
2807 West County Road 75
Monticello, MN 55362-9637

**SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT—NRC INTEGRATED
INSPECTION REPORT 05000263/2017002**

Dear Mr. Gardner:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Monticello Nuclear Generating Plant. On July 11, 2017, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The enclosed report represents the results of this inspection.

Based on the results of this inspection, the NRC has identified one issue that was evaluated under the risk significance determination process as having very-low safety significance (Green). The NRC has also determined that one violation was associated with this issue. Because the licensee initiated a condition report to address this issue, this violation is being treated as Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. The NCV is described in the subject inspection report. Further, inspectors documented a licensee-identified violation which was determined to be of very-low safety significance in this report. The NRC is treating this violation as a NCV 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 III; the Director, Office of Enforcement; and the NRC resident inspector at the Monticello Nuclear Generating Plant.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 III; and the NRC resident inspector at the Monticello Nuclear Generating 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 Kenneth Riemer Acting for/

Billy C. Dickson, Chief
Branch 2
Division of Reactor Projects

Docket No. 50-263
License No. DPR-22

Enclosure:
Inspection Report 05000263/2017002

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Letter to Peter A. Gardner from Billy C. Dickson dated August 11, 2017

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT—NRC INTEGRATED
INSPECTION REPORT 05000263/2017002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-263
License No: DPR-22

Report No: 05000263/2017002

Licensee: Northern States Power Company, Minnesota

Facility: Monticello Nuclear Generating Plant

Location: Monticello, MN

Dates: April 1, 2017, through June 30, 2017

Inspectors: P. Zurawski, Senior Resident Inspector
D. Krause, Resident Inspector
V. Meghani, Reactor Inspector
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Branch 2
Division of Reactor Projects

Enclosure

TABLE OF CONTENTS

SUMMARY	2
REPORT DETAILS	4
Summary of Plant Status.....	4
1. REACTOR SAFETY	4
1R01 Adverse Weather Protection (71111.01).....	4
1R04 Equipment Alignment (71111.04)	5
1R05 Fire Protection (71111.05)	6
1R06 Flooding (71111.06).....	7
1R08 Inservice Inspection Activities (71111.08).....	7
1R11 Licensed Operator Requalification Program (71111.11).....	9
1R12 Maintenance Effectiveness (71111.12).....	10
1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)	10
1R15 Operability Determinations and Functional Assessments (71111.15)	11
1R18 Plant Modifications (71111.18)	12
1R19 Post-Maintenance Testing (71111.19).....	12
1R20 Outage Activities (71111.20).....	13
1R22 Surveillance Testing (71111.22)	14
2. RADIATION SAFETY	16
2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)	16
2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls (71124.02).....	20
2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)	22
2RS4 Occupational Dose Assessment (71124.04).....	24
4. OTHER ACTIVITIES	27
4OA1 Performance Indicator Verification (71151)	27
4OA2 Identification and Resolution of Problems (71152)	28
4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153)	29
4OA5 Other Activities	32
4OA6 Management Meetings	33
4OA7 Licensee-Identified Violations	33
SUPPLEMENTAL INFORMATION.....	1
Key Points of Contact.....	1
List of Items Opened, Closed, and Discussed.....	2
list Of Documents Reviewed	3
List of Acronyms Used	13

SUMMARY

Inspection Report 05000263/2017002; 04/01/17 through 06/30/17, Monticello Nuclear Generating Plant; Follow-Up of Events and Notices of Enforcement Discretion.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding was identified by the inspectors. This finding was considered a Non-Cited Violation of the U.S. Nuclear Regulatory Commission (NRC) regulations. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

NRC-Identified and Self-Revealed Findings

Green. A self-revealed finding of very-low safety significance and a Non-Cited Violation of Technical Specification 5.4.1.a occurred on April 15, 2017, due the licensee's failure to establish, implement and maintain procedures regarding shutdown operations. Specifically, Operations Manual B.06.05-05 did not account for the state of the opposite train of feedwater when shutting down the 11 Reactor Feedwater Pump. Licensee use of the inadequate procedure placed equipment in a configuration where no condensate flow path to the reactor existed causing reactor water level to lower to a point where trip/isolation set-points were reached. This caused an unplanned Reactor Protection System (RPS) trip and Partial Group II Isolation. The licensee initiated Corrective Action Program (CAP) 1555785 to document the reactor water level transient, RPS trip and Partial Group II Isolation. Immediate corrective actions included opening the 11 Reactor Feedwater Pump discharge valve to restore reactor water level allowing reset of the Group II isolation and RPS trip. Subsequent licensee actions included development of expectations via an Operations Memo and revision to Operations Manual B.06.05-05 as well as Procedure 2204 and Procedure 2167 to ensure abnormal equipment lineups are addressed such that unexpected procedure interactions are avoided.

The inspectors determined the failure to establish, implement and maintain procedures regarding shutdown operations as required by Technical Specification 5.4.1.a was a performance deficiency that required an evaluation. The inspectors assessed the significance of this finding using IMC 0609, Attachment 4, and IMC 0609, Appendix A, Exhibit 1, Section B, and determined a detailed risk evaluation was required because the finding caused a reactor trip and loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (e.g., loss of feedwater). A Senior Reactor Analyst performed a detailed risk evaluation using bounding assumptions and the change in Core Damage Frequency was calculated to be $9E-7$ /year (Green). The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting area of Human Performance, Change Management aspect, because licensee leaders did not use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. (Section 4OA3) [H.3]

Licensee-Identified

Violations of very-low safety or security significance or Severity Level IV that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's CAP. These violations and CAP tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Monticello operated at 100 percent power at the beginning of the inspection period.

On April 10, 2017, power was reduced to approximately 58 percent for pre-outage maintenance on the 12 reactor feedwater pump. On April 14, 2017, the unit was taken offline for a refueling outage. On May 13, 2017, after completion of outage activities, power ascension and post-outage testing activities began and 100 percent power was achieved on May 17, 2017. On June 3, 2017, power was reduced to approximately 50 percent for quarterly turbine testing and investigation of condenser in-leakage. Power was returned to 100 percent on June 6, 2017, where it remained through the end of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

.1 External Flooding

a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Updated Safety Analysis Report (USAR) for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also walked down underground bunkers/manholes subject to flooding that contained multiple train or multiple function risk-significant cables. The inspectors also reviewed the Abnormal Operating Procedure for mitigating the design basis flood to ensure it could be implemented as written. Documents reviewed are listed in the Attachment to this report.

This activity constituted one external flooding sample as defined in Inspection Procedure (IP) 71111.01-05.

b. Findings

No findings were identified.

.2 Summer Seasonal Readiness Preparations

a. Inspection Scope

The inspectors performed a review of the licensee's preparations for summer weather for selected systems, including conditions that could lead to an extended drought.

During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the USAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Documents reviewed are listed in the Attachment to this report. The inspectors also reviewed Corrective Action Program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- Substation; and
- Transformers.

This activity constituted one summer seasonal adverse weather sample as defined in IP 71111.01–05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns (71111.04Q)

a. Inspection Scope

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

- 12 Emergency Diesel Generator;
- Lower 4 KV Switchgear; and
- "A" Residual Heat Removal (RHR) System.

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 impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, USAR, Technical Specification (TS) requirements, 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 walked down 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 CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted three partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Fire Zone 2–A; Reactor Core Isolation Cooling (RCIC)/Traversing In-core Probe System Room;
- Fire Zone 2–G; East Shutdown Cooling Area;
- Fire Zone 2–E; Traversing In-core Probe Drive Cubicle;
- Fire Zone 2–F; Main Steam Chase;
- Fire Zone 12–C; Condenser;
- Fire Zone 2–H; West Shutdown Cooling Area; and
- Fire Zone 200; Drywell.

The inspectors reviewed areas to assess if the licensee 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 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 impact equipment which 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 to this report, 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 CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted seven quarterly fire protection inspection samples as defined in IP 71111.05–05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Underground Vaults

a. Inspection Scope

The inspectors selected underground bunkers/manholes subject to flooding that contained cables whose failure could disable risk-significant equipment. The inspectors determined that the cables were not submerged, that splices were intact, and that appropriate cable support structures were in place. In those areas where dewatering devices were used, such as a sump pump, the device was operable and level alarm circuits were set appropriately to ensure that the cables would not be submerged. In those areas without dewatering devices, the inspectors verified that drainage of the area was available, or that the cables were qualified for submergence conditions. The inspectors also reviewed the licensee's corrective action documents with respect to past submerged cable issues identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following underground bunkers/manholes subject to flooding:

- 2MH02; Southwest of Radwaste Building;
- 2MH03; North of Security Diesel;
- 2MH04; Emergency Filtration Train Building;
- MH101; North of Machine Shop;
- NMH306; North of Tank Near Hot Shop;
- NMH308; Substation; and
- NMH344; West of 2RS Transformer outside Substation.

Documents reviewed during this inspection are listed in the Attachment to this report.

This activity constituted one underground vaults sample as defined in IP 71111.06–05.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

From May 15, 2017, through May 19, 2017, the inspectors conducted a review of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system (RCS), emergency core cooling systems, risk-significant piping and components, and containment systems.

The inspections described in Section 1R08.1 and Section 1R08.5 constituted one inspection sample as described by IP 71111.08.

.1 Piping Systems Inservice Inspection

a. Inspection Scope

The inspectors observed and reviewed records of the following Non-Destructive Examinations required by the American Society of Mechanical Engineers, (ASME) Section XI Code, and/or Title 10 of the *Code of Federal Regulations* (CFR), Part 50.55a to evaluate compliance with the ASME Code, Section XI and Section V, requirements, and if any indications and defects were detected, to determine whether these were dispositioned in accordance with the ASME Code or an U.S. Nuclear Regulatory Commission (NRC) approved alternative requirement.

- Ultrasonic Examination of Core Spray A, Valve to Pipe, W-1;
- Ultrasonic Examination of Core Spray A, Pipe to Pipe, W-2;
- Magnetic Particle Examination (MT) of N-2 RHR Heat Exchanger A, Shell-Pad-Nozzle;
- MT Examination of N-1 RHR Heat Exchanger A, Shell-Pad-Nozzle;
- MT Examination of WA, Core Spray Pump A Support;
- Visual-3, Examination of H-2 Containment Spray Support SR-310; and
- Visual-3, Examination of H-2 Containment Spray Support SR-311.

The inspectors reviewed the following examination record with relevant/recordable conditions/indications identified by the licensee to determine whether acceptance of these indications for continued service was in accordance with the ASME Code Section XI or an NRC-approved alternative.

- None (no samples available).

The inspectors reviewed records of the following risk-significant pressure boundary ASME Code Section XI Class 1, 2, and 3 welds fabricated since the beginning of the last refueling outage to determine if the licensee: followed the welding procedure; applied appropriate weld filler material; and implemented the applicable Section XI or construction Code Non-Destructive Examination and acceptance criteria. Additionally, the inspectors reviewed the welding procedure specifications and supporting weld procedure qualification records to determine if the weld procedure were qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- Replace Drywell Equipment Drain Sump Outboard Isolation Valve AO-2561B;
- Replace Existing Valve ESW-16 with a Stainless Steel Valve; and
- Replace Pipe with Tee and flanges due to Microbiologically Influenced Corrosion Thinning — ESW1-3”- HBD.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems entered into the licensee's CAP and conducted interviews with licensee staff to determine if:

- The licensee had established an appropriate threshold for identifying ISI-related problems;
- The licensee had performed a root cause (if applicable) and taken appropriate corrective actions; and
- The licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity.

The inspectors performed these reviews to evaluate compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Observation During Periods of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On April 14 and 15, 2017, the inspectors observed control room operators performing reactor shutdown activities in preparation for Refueling Outage (RFO) 28. On April 15, 2017, and May 4, 2017, the inspectors observed control room operator activities involving placing in and removing from service "B" RHR shutdown cooling for refueling outage RFO 28. On May 11 and 12, 2017, the inspectors observed control room operators performing reactor start-up activities and returning the unit on-line after completing refueling outage RFO 28. These activities required heightened awareness or were related to increased risk. The inspectors evaluated the following areas:

- Licensed operator performance;
- Crew's clarity and formality of communications;
- Ability to take timely actions in the conservative direction;
- Prioritization, interpretation, and verification of annunciator alarms;
- Correct use and implementation of procedures;
- Control board manipulations;
- Oversight and direction from supervisors; and
- Ability to identify and implement appropriate TS actions.

The performance in these areas was compared to pre-established operator action expectations, procedural compliance and task completion requirements. Documents reviewed are listed in the Attachment to this report.

These activities constituted three quarterly licensed operator heightened activity/risk samples as defined in IP 71111.11-05.

b. Findings

Reference Section 4OA3.2 for a self-revealed finding/Non-Cited Violation (NCV) which occurred during RFO shutdown activities on April 15, 2017.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- RHR; MO-2029 Magnesium Rotor Inspection; and
- Pressure switches for RCIC, High Steam Flow trip maintenance

The inspectors reviewed events such as where ineffective equipment maintenance had 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) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (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 CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted two quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee'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:

- “D” MSIV Closing out-of-band;
- RV-27A-H9 Snubber – Failed as found;
- Condenser Air In leakage—High Off-Gas Flow; and
- V-D-9111B (Emergency Filtration Train Filter Discharge Damper) Failure.

These activities were selected based on their potential risk significance relative to the RSC. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. 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 TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Documents reviewed during this inspection are listed in the Attachment to this report.

These maintenance risk assessments and emergent work control activities constituted four samples as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Core Spray Cracked Fitting;
- Drywell Nitrogen Inventory;
- HCU 38-27, CRD-111 Valve Leaks;
- “B” Feed Regulator Valve Controller MTS-6-84B High Noise; and
- HO-7, High Pressure Core Injection (HPCI) Turbine Stop Valve Failed to Open.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and 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 TS and USAR 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. The inspectors determined, where appropriate, compliance with bounding limitations associated with

the evaluations. 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. Documents reviewed are listed in the Attachment to this report.

This operability inspection constituted five samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification:

- Engineering Change 26208–TSTF–523, Emergency Core Cooling System High Point Vents HPCI/RCIC.

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screening against the design basis, the USAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system(s). The inspectors, as applicable, observed ongoing and completed work activities to ensure that the modifications were installed as directed and consistent with the design control documents; the modifications operated as expected; post-modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. As applicable, the inspectors verified that relevant procedure, design, and licensing documents were properly updated. Lastly, the inspectors discussed the plant modification with operations, engineering, and training personnel to ensure that the individuals were aware of how the operation with the plant modification in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

This activity constituted one permanent plant modification sample as defined in IP 71111.18–05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- MO-2-53B 12 Recirculation Pump Discharge;
- HPCI-31;
- IRM-12, IRM-14, SRM-22 Cable Replacement;
- MO-2029 Magnesium Rotor Inspection; and
- MTS-6-84B Replacement.

These activities were selected based upon the structure, system, or component's ability to impact 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; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSS, the USAR, 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 PM tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

These activities constituted five PM testing samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R20 Outage Activities (71111.20)

.1 Refueling Outage Activities

a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for the RFO, conducted April 15, 2017, through May 14, 2017, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

- licensee configuration management, including maintenance of defense-in-depth commensurate with the OSP for key safety functions and compliance with the applicable TS when taking equipment out of service;
- implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;

- controls over the status and configuration of electrical systems to ensure that TS and OSP requirements were met, and controls over switchyard activities;
- monitoring of decay heat removal processes, systems, and components;
- controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- controls over activities that could affect reactivity;
- maintenance of secondary containment as required by TS;
- licensee fatigue management, as required by 10 CFR Part 26, Subpart I;
- refueling activities, including fuel handling and sipping to detect fuel assembly leakage;
- startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing; and
- licensee identification and resolution of problems related to RFO activities.

Documents reviewed are listed in the Attachment to this report.

This activity constituted one RFO activity sample as defined in IP 71111.20–05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- 1043–03 Turbine Overspeed Trip Test [ROUTINE];
- 0151–01 Secondary Containment Capability Test [ROUTINE];
- Reactor Mode Switch in Shutdown SCRAM Test [ROUTINE];
- OSP–ECC–0566 ECCS Low Pressure Automatic Initiation and Loss of Power Test [ROUTINE];
- OPS–AIR–0255–17–IA–1 Instrument Air System Valve Exercise [CIV];
- 0255–20–IIC–2 Reactor Coolant Pressure Boundary Leakage Test [RCS];
- 0081 Control Rod Drive SCRAM Insertion Time Tests [IST]; and
- MO–2036 HPCI Turbine Steam Supply A [IST].

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, ASME code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

These activities constituted four routine surveillance testing sample(s), one containment isolation valve sample, one RCS leak detection inspection sample, and two inservice test samples as defined in IP 71111.22, Section-02 and Section-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

.1 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors assessed the licensee's current and historic isotopic mix, including alpha emitters and other hard-to-detect radionuclides. The inspectors evaluated whether survey protocols were reasonable to identify the magnitude and extent of the radiological hazards.

The inspectors determined if there have been changes to plant operations since the last inspection that may have resulted in a significant new radiological hazard for onsite individuals. The inspectors evaluated whether the licensee assessed the potential impact of these changes and implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard. The inspectors reviewed the last two radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and performed independent radiation measurements as needed to verify conditions were consistent with documented radiation surveys.

The inspectors assessed the adequacy of pre-work surveys for select radiologically risk-significant work activities.

The inspectors evaluated the Radiological Survey Program to determine if hazards were properly identified. The inspectors discussed procedures, equipment, and performance of surveys with radiation protection staff and assessed whether technicians were knowledgeable about when and how to survey areas for various types of radiological hazards.

The inspectors reviewed work in potential airborne areas to assess whether air samples were being taken appropriately for their intended purpose and reviewed various survey records to assess whether the samples were collected and analyzed appropriately. The inspectors also reviewed the licensee's program for monitoring contamination, which has the potential to become airborne.

These activities constituted one complete radiological hazard assessment sample as defined in IP 71124.01-05.

b. Findings

No findings were identified.

.2 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors reviewed select radiation work permits used to access high radiation areas and evaluated the specified work control instructions or control barriers. The inspectors also assessed whether workers were made aware of the work instructions and area dose rates.

The inspectors reviewed electronic alarming dosimeter dose and dose rate alarm set point methodology. For selected electronic alarming dosimeter occurrences, the inspectors assessed the worker's response to the alarm, the licensee's evaluation of the alarm, and any follow-up investigations.

The inspectors reviewed the licensee's methods for informing workers of changes in plant operations or radiological conditions that could significantly impact their occupational dose.

The inspectors reviewed the labeling of select containers of licensed radioactive material that could cause unplanned or inadvertent exposure to workers.

These activities constituted one complete radiological hazard assessment sample as defined in IP 71124.01-05.

b. Findings

No findings were identified.

.3 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitors material leaving the radiologically controlled area and assessed the methods used for control, survey, and release of material from these areas. As available, the inspectors observed health physics personnel surveying and releasing material for unrestricted use.

The inspectors observed workers leaving the radiologically controlled area and assessed their use of tool and personal contamination monitors and reviewed the licensee's criteria for use of the monitors.

The inspectors assessed whether instrumentation was used at its typical sensitivity levels based on appropriate counting parameters or whether the licensee had established a de facto release limit.

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact. The inspectors also evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

These activities constituted one complete contamination and radioactive material control sample as defined in IP 71124.01-05.

b. Findings

No findings were identified.

.4 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

The inspectors evaluated ambient radiological conditions during tours of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, radiation work permits, and worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage, and contamination controls. The inspectors evaluated the licensee's use of electronic alarming dosimeters in high noise areas as high radiation area monitoring devices.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that the licensee properly employed a NRC-approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in work areas with significant dose rate gradients.

For select airborne area radiation work permits, the inspectors reviewed airborne radioactivity controls and monitoring, the potential for significant airborne levels, containment barrier integrity, and temporary filtered ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials stored within pools and assessed whether appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

These activities constituted one complete radiological hazards control and work coverage sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.5 High Radiation Area and Very High Radiation Area Controls (02.06)

a. Inspection Scope

The inspectors observed posting and physical controls for high radiation areas and very high radiation areas to assess adequacy.

The inspectors conducted a selective inspection of posting and physical controls for high radiation areas and very high radiation areas to assess conformance with performance indicators.

The inspectors reviewed procedural changes to assess the adequacy of access controls for high and very high radiation areas to determine whether procedural changes substantially reduced the effectiveness and level of worker protection.

The inspectors assessed the controls the high radiation areas greater than 1 rem/hour and areas with the potential to become high radiation areas greater than 1 rem/hour for compliance with TSs and procedures.

The inspectors assessed the controls for very high radiation areas and areas with the potential to become very high radiation areas. The inspectors also assessed whether individuals were unable to gain unauthorized access to these areas.

These activities constituted one complete high radiation area and very high radiation area controls sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.6 Radiation Worker Performance and Radiation Protection Technician Proficiency (02.07)

a. Inspection Scope

The inspectors observed radiation worker performance and assessed their performance with respect to radiation protection work requirements, the level of radiological hazards present, and radiation work permit controls.

The inspectors assessed worker awareness of electronic alarming dosimeter set points, stay times, or permissible dose for radiologically significant work as well as expected response to alarms.

The inspectors observed radiation protection technician performance and assessed whether the technicians were aware of the radiological conditions and radiation work permit controls and whether their performance was consistent with training and qualifications for the given radiological hazards.

The inspectors observed radiation protection technician performance of radiation surveys and assessed the appropriateness of the instruments being used, including calibration and source checks.

These activities constituted one complete radiation worker performance and radiation protection technician proficiency sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.7 Problem Identification and Resolution (02.08)

a. Inspection Scope

The inspectors assessed whether problems associated with radiological hazard assessment and exposure controls were being identified at an appropriate threshold and were properly addressed for resolution. For select problems, the inspectors assessed the appropriateness of the corrective actions. The inspectors also assessed the licensee's program for reviewing and incorporating operating experience.

The inspectors reviewed select problems related to human performance errors and assessed whether there was a similar cause and whether corrective actions taken resolve the problems.

The inspectors reviewed select problems related to radiation protection technician error and assessed whether there was a similar cause and whether corrective actions taken resolve the problems.

These activities constituted one complete problem identification and resolution sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls (71124.02)

.1 Verification of Dose Estimates and Exposure Tracking Systems (02.03)

a. Inspection Scope

The inspectors assessed whether the assumptions and basis for the current annual collective exposure estimate were reasonably accurate. The inspectors assessed source term reduction effectiveness and reviewed applicable procedures for estimating exposures from specific work activities.

The inspectors reviewed the assumptions and bases in as-low-as-reasonably-achievable (ALARA) work planning documents for selected activities and verified that the licensee has established measures to track, trend, and if necessary to reduce, occupational doses for ongoing work activities.

The inspectors determined whether a dose threshold criteria was established to prompt additional reviews and/or additional ALARA planning and controls and evaluated the licensee's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors determined if adjustments to exposure estimates were based on sound radiation protection and ALARA principles or if they are just adjusted to account for failures to control the work. The inspectors evaluated whether there was sufficient station management review and approval of adjustments to exposure estimates and that the reasons for the adjustments were justifiable.

These activities constituted a partial verification of dose estimates and exposure tracking systems sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.2 Implementation of As-Low-As-Reasonably-Achievable and Radiological Work Controls (02.04)

a. Inspection Scope

The inspectors reviewed the radiological administrative, operational, and engineering controls planned for selected radiologically significant work activities and evaluated the integration of these controls and ALARA requirements into work packages, work procedures and/or radiation work permits.

The inspectors conducted observations of in-plant work activities and assessed whether the licensee had effectively integrated the planned administrative, operational, and engineering controls into the actual field work to maintain occupational exposure ALARA. The inspectors observed pre-job briefings, and determined if the planned controls were discussed with workers. The inspectors evaluated the placement and use of shielding, contamination controls, airborne controls, radiation work permit controls, and other engineering work controls against the ALARA plans.

The inspectors assessed licensee activities associated with work-in-progress to ensure the licensee was tracking doses, performed timely in-progress reviews, and, when jobs did not trend as expected, appropriately communicated additional methods to be used to reduce dose. The inspectors evaluated whether health physics and ALARA staff were involved with the management of radiological work control when in-field activities deviated from the planned controls. The inspectors assessed whether the Outage Control Center and station management provided sufficient support for ALARA re-planning.

The inspectors assessed the involvement of ALARA staff with emergent work activities during maintenance and when possible, attended in-progress review discussions, outage status meetings, and/or ALARA committee meetings.

These activities constituted a partial implementation of ALARA and radiological work controls sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.3 Radiation Worker Performance (02.05)

a. Inspection Scope

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or high radiation areas to assess whether workers demonstrated the ALARA philosophy in practice and followed procedures. The inspectors observed radiation worker performance to evaluate whether the training and skill level was sufficient with respect to the radiological hazards and the work involved.

The inspectors interviewed individuals from selected work groups to assess their knowledge and awareness of planned and/or implemented radiological and ALARA work controls.

These activities constituted one complete radiation worker performance sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

.1 Engineering Controls (02.02)

a. Inspection Scope

The inspectors reviewed procedural guidance for use of ventilation systems, and assessed whether the systems were used, to the extent practicable, during high-risk activities to control airborne radioactivity and minimize the use of respiratory protection. The inspectors assessed whether installed ventilation airflow capacity, flow path, and filter/charcoal unit efficiencies for selected systems were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne area to the extent practicable. The inspectors also evaluated whether selected temporary ventilation systems used to support work in contaminated areas were consistent with licensee procedural guidance and ALARA.

The inspectors reviewed select airborne monitoring protocols to assess whether alarms and set points were sufficient to prompt worker action. The inspectors assessed whether the licensee established trigger points for evaluating levels of airborne beta-emitting and alpha-emitting radionuclides.

These activities constituted one complete in-plant airborne radioactivity control and mitigation sample as defined in IP 71124.03–05.

b. Findings

No findings were identified.

.2 Use of Respiratory Protection Devices (02.03)

a. Inspection Scope

The inspectors assessed whether the licensee provided respiratory protection devices for those situations where it was impractical to employ engineering controls such that occupational doses were ALARA. For select instances where respiratory protection devices were used, the inspectors assessed whether the licensee concluded that further engineering controls were not practical. The inspectors also assessed whether the licensee had established means to verify that the level of protection provided by the respiratory protection devices was at least as good as that assumed in the work controls and dose assessment.

The inspectors assessed whether the respiratory protection devices used to limit the intake of radioactive materials were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration or have been approved by the NRC. The inspectors evaluated whether the devices were used consistent with their National Institute for Occupational Safety and Health/Mine Safety and Health Administration certification or any conditions of their NRC-approval.

The inspectors reviewed records of air testing for supplied-air devices and Self-Contained Breathing Apparatus (SCBA) bottles to assess whether the air used met or exceeded Grade D quality. The inspectors evaluated whether plant breathing air supply systems satisfied the minimum pressure and airflow requirements for the devices.

The inspectors evaluated whether selected individuals qualified to use respiratory protection devices had been deemed fit to use the devices by a physician.

The inspectors reviewed training curricula for use of respiratory protection devices to assess whether individuals are adequately trained on donning, doffing, function checks, and how to respond to a malfunction.

The inspectors observed the physical condition of respiratory protection devices ready for issuance and reviewed records of routine inspection for selected devices. The inspectors reviewed records of maintenance on the vital components for selected devices and assessed whether onsite personnel assigned to repair vital components received vendor-provided training.

These activities constituted one complete use of respiratory protection devices sample as defined in IP 71124.03–05.

b. Findings

No findings were identified.

.3 Self-Contained Breathing Apparatus for Emergency Use (02.04)

a. Inspection Scope

The inspectors reviewed the status and surveillance records for select SCBAs. The inspectors evaluated the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions.

The inspectors assessed whether control room operators and other emergency response and radiation protection personnel were trained and qualified in the use of SCBAs and evaluated whether personnel assigned to refill bottles were trained and qualified for that task.

The inspectors assessed whether appropriate mask sizes and types were available for use. The inspectors evaluated whether on-shift operators had no facial hair that would interfere with the sealing of the mask and that appropriate vision correction was available.

The inspectors reviewed the past 2 years of maintenance records for selected inservice SCBA units used to support operator activities during accident conditions. The inspectors assessed whether maintenance or repairs on an SCBA unit's vital components were performed by an individual certified by the manufacturer of the device to perform the work. The inspectors evaluated the onsite maintenance procedures governing vital component work to determine whether there was any inconsistencies with the SCBA manufacturer's recommended practices. The inspectors evaluated whether SCBA cylinders satisfied the hydrostatic testing required by the U.S. Department of Transportation.

These activities constituted one complete SCBA sample as defined in IP 71124.03–05.

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.05)

a. Inspection Scope

The inspectors assessed whether problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. Additionally, the inspectors evaluated the appropriateness of the corrective actions for selected problems involving airborne radioactivity documented by the licensee.

This activity constituted one complete problem identification and resolution sample as defined in IP 71124.03–05.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

.1 Source Term Characterization (02.02)

a. Inspection Scope

The inspectors evaluated whether the licensee had characterized the radiation types and energies being monitored and that the characterization included gamma, beta, hard-to-detects, and neutron radiation.

The inspectors assessed whether the licensee had developed scaling factors for including hard-to-detect nuclide activity in internal dose assessments.

This activity constituted one complete source term characterization sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

.2 External Dosimetry (02.03)

a. Inspection Scope

The inspectors evaluated whether the licensee's dosimetry vendor was National Voluntary Laboratory Accreditation Program accredited and if the approved irradiation test categories for each type of personnel dosimeter used were consistent with the types and energies of the radiation present and the way the dosimeter was being used.

The inspectors evaluated the onsite storage of dosimeters before their issuance, during use, and before processing/reading. For personal dosimeters stored onsite during the monitoring period, the inspectors evaluated whether they were stored in low dose areas with control dosimeters. For personal dosimeters that are taken off-site during the monitoring period, the inspectors evaluated the guidance provided to individuals with respect to care and storage of the dosimeter.

The inspectors evaluated the calibration of active dosimeters. The inspectors assessed the bias of the active dosimeters compared to passive dosimeters and the correction factor used. The inspectors also assessed the licensee's program for comparing active and passive dosimeter results, investigations for substantial differences, and recording of dose. The inspectors assessed whether there were adverse trends for active dosimeters.

These activities constituted one complete external dosimetry sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

.3 Internal Dosimetry (02.04)

a. Inspection Scope

The inspectors reviewed procedures used to assess internal dose using whole body counting equipment to evaluate whether the procedures addressed methods for differentiating between internal and external contamination, the release of contaminated individuals, the route of intake and the assignment of dose. The inspectors assessed whether the frequency of measurements was consistent with the biological half-life of the nuclides available for intake. The inspectors reviewed the licensee's evaluation for use of portal radiation monitors as a passive monitoring system to determine if instrument minimum detectable activities were adequate to detect internally deposited radionuclides sufficient to prompt additional investigation. The inspectors reviewed whole body counts and evaluated the equipment sensitivity, nuclide library, review of results, and incorporation of hard-to-detect radionuclides.

The inspectors reviewed procedures used to determine internal dose using in vitro analysis to assess the adequacy of sample collection, determination of entry route and assignment of dose.

The inspectors reviewed the licensee's program for dose assessment based on air sampling, as applicable, and calculations of derived air concentration. The inspectors determined whether flow rates and collection times for air sampling equipment were adequate to allow lower limits of detection to be obtained. The inspectors also reviewed the adequacy of procedural guidance to assess internal dose if respiratory protection was used.

The inspectors reviewed select internal dose assessments and evaluated the monitoring protocols, equipment, and data analysis.

These activities constituted one complete internal dosimetry sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

.4 Special Dosimetric Situations (02.05)

a. Inspection Scope

The inspectors assessed whether the licensee informs workers of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for declaring a pregnancy. The inspectors selected individuals who had declared pregnancy during the current assessment period and evaluated whether the monitoring program for declared pregnant workers was technically adequate to assess the dose to the embryo/fetus. The inspectors assessed results and/or monitoring controls for compliance with regulatory requirements.

The inspectors reviewed the licensee's methodology for monitoring external dose in non-uniform radiation fields or where large dose gradients exist. The inspectors evaluated the licensee's criteria for determining when alternate monitoring was to be implemented. The inspectors reviewed dose assessments performed using multi-badging to evaluate whether the assessment was performed consistently with licensee procedures and dosimetric standards.

The inspectors evaluated the licensee's methods for calculating shallow dose equivalent from distributed skin contamination or discrete radioactive particles.

The inspectors evaluated the licensee's program for neutron dosimetry, including dosimeter types and/or survey instrumentation. The inspectors reviewed select neutron exposure situations and assessed whether dosimetry and/or instrumentation was appropriate for the expected neutron spectra, there was sufficient sensitivity, and neutron dosimetry was properly calibrated. The inspectors also assessed whether interference by gamma radiation had been accounted for in the calibration and whether time and motion evaluations were representative of actual neutron exposure events.

For the special dosimetric situations reviewed in this section, the inspectors assessed how the licensee assigned dose of record. This included an assessment of external and internal monitoring results, supplementary information on individual exposures, and radiation surveys and/or air monitoring results when dosimetry was based on these techniques.

These activities constituted one complete specific dosimetric situation sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

.5 Problem Identification and Resolution (02.06)

a. Inspection Scope

The inspectors assessed whether problems associated with occupational dose assessment were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving occupational dose assessment.

These activities constituted one complete problem identification and resolution sample as defined in IP 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

40A1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failure Performance Indicator (PI) for the period from the second quarter 2016 through first quarter 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of April 2016 through March 2017 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 PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This activity constituted one safety system functional failure sample as defined in IP 71151–05.

b. Findings

No findings were identified.

.2 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Leakage performance indicator for the period from the second quarter 2016 through first quarter 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of April 2016, through March 2017, 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 PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This activity constituted one RCS leakage sample as defined in IP 71151-05.

b. Findings

No findings were identified.

40A2 Identification and Resolution of Problems (71152)

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's CAP at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed. Some minor issues were entered into the licensee's CAP as a result of the inspectors' observations; however, they are not discussed in this report.

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.

b. Findings

No findings were identified.

.2 Annual Follow-up of Selected Issue: [Title 10 of the Code of Federal Regulations, Part 21 Notification Affecting Anchor Darling Double Disc Gate Valve Wedge Pin Failures]

a. Inspection Scope

The inspectors selected the following condition reports for in-depth review:

- (CAP 1366406 & CAP 1373645) 10 CFR Part 21 Notification Affecting Anchor Darling Double Disc Gate Valve Wedge Pin Failures.

As appropriate, the inspectors verified the following attributes during their review of the licensee's CAPs for the above condition reports and other related condition reports:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause, and previous occurrences;
- evaluation and disposition of operability/functionality/reportability issues;
- classification and prioritization of the resolution of the problem commensurate with safety significance;
- identification of corrective actions, which were appropriately focused to correct the problem;
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue;
- effectiveness of corrective actions taken to preclude repetition; and
- evaluate applicability for operating experience and communicate applicable lessons learned to appropriate organizations.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel.

This review constituted one in-depth problem identification and resolution inspection sample as defined in IP 71152.

b. Findings

No findings were identified.

40A3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report 5000263/2017-001-00: Reactor Scram and Group II Isolation Due to 11 Reactor Feed Pump Removal from Service with 12 Reactor Feed Pump Isolated

a. Inspection Scope

This event, which occurred on April 15, 2017, involved the licensee's loss of feedwater to the reactor vessel resulting in lowered reactor water level. Specifically, on April 10, 2017, prior to the 2017 RFO, the 12 Reactor Feedwater Pump (RFP) was removed from service and isolated for maintenance. On April 15, 2017, at 0142 hours, a manual reactor SCRAM was inserted to shutdown the plant for the 2017 RFO. On

April 15, 2017, at 0436 hours, with the unit in Mode 3, the 11 RFP in the Feedwater System was removed from service in accordance with plant shutdown procedures and the 11 RFP discharge valve was closed. With the 11 RFP discharge valve closed and the 12 RFP previously isolated, there was no make-up flow path lined-up for the condensate pumps to supply water to the reactor vessel. Reactor water level lowered, and at approximately 0441 hours, resulted in a valid Reactor Protection System (RPS) trip SCRAM signal and a valid Primary Containment Group II Isolation signal when level decreased below +9 inches as indicated on the safeguards level instrumentation. The 11 RFP discharge valve was reopened to reestablish a flow path from the condensate pumps restoring reactor water level. The RPS and Group II Isolation logic was reset at 0452 hours and 0500 hours, respectively. An 8-hour event notification was made pursuant to 10 CFR 50.72(b)(3)(iv)(A).

The inspectors reviewed the licensee's causal evaluation with two identified apparent causes. First, operators failed to identify and address the unusual Condensate and RFP configuration prior to execution of the 11 RFP shutdown. Second, the guidance for shutdown of the RFP in the Condensate and RFP operation procedure did not take into account the state of the other train when shutting down a RFP. The inspectors reviewed the licensee's event report, causal analysis, and immediate/long term corrective actions for the event and identified a self-revealed Green finding and NCV, which is discussed below. Documents reviewed are listed in the Attachment to this report. This Licensee Event Report is closed.

This event follow-up review constituted one follow-up of events sample as defined in IP 71153-05.

b. Findings

Introduction: A self-revealed finding of very-low safety significance (Green) and an NCV of TS 5.4.1.a occurred on April 15, 2017, due the licensee's failure to establish, implement and maintain procedures regarding shutdown operations. Specifically, Operations Manual B.06.05-05 did not account for the state of the opposite train of feedwater when shutting down the 11 RFP. Licensee use of an inadequate procedure placed equipment in a configuration where no condensate flow path to the reactor existed causing reactor water level to lower to a point where trip/isolation set-points were reached. This caused an unplanned RPS trip and Partial Group II Isolation.

Description: The licensee had removed and isolated the 12 RFP from service on April 10, 2017, for pre-refueling outage maintenance work RFO shutdown activities commenced on April 14, 2017, with a planned outage-related manual reactor SCRAM occurring on April 15, 2017, at 0142 hours. Subsequently, Operations continued to shut the plant down in accordance with operational procedures, including Operations Manual B.06.05-05, "Shutdown of the Condensate and Reactor Feedwater System". Revision 51 of B.06.05-05 was used to shutdown the 11 RFP, including closure of the associated manually-operated discharge valve (0436 hours). However, the procedure did not account for the state of the opposite train of feedwater when shutting down the 11 RFP. Licensee use of that inadequate procedure placed equipment in a configuration where no condensate flow path to the reactor existed. Specifically, closure of the

11 RFP discharge valve, combined with the 12 RFP being isolated, resulted in no flow path for the Condensate pumps to continue to feed the reactor vessel. Consequently, reactor water level lowered to a point where trip/isolation set-point was reached causing an unplanned RPS trip and Partial Group II Isolation.

Inspectors determined control room operators identified the lowering reactor water level immediately after closure of the 11 RFP discharge valve and initiated action for out plant operators to re-establish a flow path to the reactor by re-opening the valve. While out-plant operators were re-opening the valve, reactor water level had lowered to the trip/isolation set point resulting in a RPS trip and Partial Group II Isolation (0445 hours). Control room operators initiated recovery actions to reset the RPS trip and Partial Group II Isolation, actions which were completed 15 minutes later. Immediate licensee corrective actions included opening the 11 RFP discharge valve to restore reactor water level allowing reset of the Group II Isolation and RPS trip. The inspectors determined the immediate operator actions in response to the reactor water level transient were appropriate. The licensee initiated CAP 1555785 to document the reactor water level transient, RPS trip and Partial Group II Isolation.

The inspectors also reviewed subsequent licensee corrective actions, including the apparent cause evaluation report. Subsequent licensee actions included development of expectations via an Operations Memo and revision to Operations Manual B.06.05–05 as well as Procedure 2204 and Procedure 2167 to ensure abnormal equipment lineups are addressed such that unexpected procedure interactions are avoided. The inspectors determined these actions had been completed and were satisfactory. The inspectors reviewed the licensee's apparent cause evaluation report and determined it documented two potential causes for the event. The first cause was that the Operations Manual procedure (B.06.05-05) for shutting down the 11 RFP was flawed in that it couldn't be performed as written, when the 12 RFP was isolated, without isolating flow to the reactor vessel. The second cause was that Operations failed to identify and address the fundamental feedwater system configuration issue prior to execution. Inspectors concluded these causes were appropriate for the transient event.

Analysis: The inspectors determined that the failure to establish, maintain, and implement Operations Manual B.06.05-05 for shutdown operations in violation of TS 5.4.1.a, was a performance deficiency that required an evaluation using the Significance Determination Process. Inspectors also determined that the performance deficiency was within the licensee's ability to foresee and correct and should have been prevented. Specifically, Operations Manual B.06.05–05 did not account for the state of the other train of feedwater when shutting down the 11 RFP. The inadequate procedure resulted in low reactor water level causing an unplanned RPS trip SCRAM and Partial Group II Isolation on April 15, 2017.

This finding was more-than-minor because it was associated with the procedure quality attribute of the Initiating Events Cornerstone, impacting the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations. The inspectors applied Inspection Manual Chapter 0609, Attachment 4, and Inspection Manual Chapter 0609, Appendix A, Exhibit 1, Section B, for "Initiating Events," to screen this finding and determined a detailed risk evaluation was required because the finding caused a reactor trip and loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (e.g., loss of feedwater). A Senior Reactor

Analyst performed a detailed risk evaluation by calculating the Conditional Core Damage Probability of a loss of normal feedwater event using the Monticello Simplified Plant Analysis Risk Model and then applying a Human Error Probability which quantified the likelihood that operators would not recover feedwater injection to the core. Using bounding assumptions that did not account for lower decay heat levels and other factors that would lower risk, the change in Core Damage Frequency was calculated to be 9E-7 (Green).

The inspectors determined that this issue was cross-cutting in the Human Performance, Change Management aspect (H.3), because licensee leaders did not use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, with the 12 RFP isolated, the licensee did not recognize the need to revise Operations Manual B.06.05–05 to account for the state of the other train of feedwater when shutting down the 11 RFP.

Enforcement: The TS 5.4.1.a requires that written procedures be established, implemented and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Section 4.0 of Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, requires procedures for startup, operation, and shutdown of the feedwater system. Contrary to the above, on April 15, 2017, the licensee failed to establish, implement and maintain Operations Manual B.06.05–05, “Condensate and Reactor Feedwater,” Revision 51. Specifically, that procedure did not account for the state of the other train of feedwater when shutting down the 11 RFP even though the 12 RFP had been isolated 5 days. Consequently, the procedure could not be performed, with the 12 RFP was isolated, without isolating flow to the reactor vessel and its use resulted in low reactor water level causing an unplanned RPS trip SCRAM and Partial Group II Isolation. Because this violation was of very-low safety significance and it was entered into CAP 1555785, this issue is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 5000263/2017002–01: Low Reactor Water Level During Shutdown of 11 Reactor Feedwater Pump)**. Immediate corrective actions included opening the 11 RFP discharge valve to restore reactor water level allowing reset of the Group II Isolation and RPS trip. Subsequent licensee actions included development of expectations via an Operations Memo and revision to Operations Manual B.06.05–05 as well as Procedure 2204 and Procedure 2167 to ensure abnormal equipment lineups are addressed such that unexpected procedure interactions are avoided.

4OA5 Other Activities

.1 World Association of Nuclear Operators Report Review

a. Inspection Scope

The inspectors reviewed the final report for the World Association Nuclear Operators plant assessment of Monticello conducted in October 2016. The inspectors evaluated this report to ensure that NRC perspectives of Xcel Energy performance were consistent with any issues identified during the assessment. The inspectors also reviewed this report to determine whether World Association Nuclear Operators identified any significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Interim Exit Meetings

Interim exit was conducted for:

- Radiation Safety Program inspection results were reviewed with Mr. Pete Gardner, Senior Vice President, on April 21, 2017; and
- ISI Inspection results were reviewed with Nuclear Engineering Program Manager Mr. P. Young and other members of the licensee staff on May 19, 2017.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

4OA7 Licensee-Identified Violations

The following violation of very-low significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- The licensee identified a finding of very low safety significance (Green) and associated NCV of TS 3.7.1, "Residual Heat Removal Service Water [RHRSW] System; which requires, in part, that two RHRSW subsystems shall be operable in Modes 1, 2, and 3 or per Condition A, "One RHRSW subsystem inoperable"; the RHRSW subsystem must be restored to OPERABLE status within 7 days or the applicable conditions and required actions of Limiting Condition for Operations 3.4.7, "Residual Heat Removal Shutdown Cooling System – Hot Shutdown," for RHR shutdown cooling made inoperable by RHRSW System must be entered. Contrary to the above, on March 27, 2017, the licensee exited the requirements in TS 3.7.1, with a Tag Section still hanging, rendering "B" RHRSW subsystem inoperable, while in Mode 1. This was identified by the licensee when the maintenance organization notified operations that work was complete, and the Tag Section was released. The licensee reentered TS 3.7.1, Condition A, entered the issue as CAP 1554105 and assigned a Human Performance Event Investigation. A crew clock reset was also taken as well as communicating lessons learned to the entire plant organization.

This finding was more-than minor because the performance deficiency was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected its objective to ensure the availability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, RHRSW System is designed to provide cooling water for the RHR System heat exchangers, required for a safe reactor shutdown following a Design Basis Accident or transient. Two RHRSW subsystems are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post-accident heat loads, assuming the worst case single active failure occurs coincident with the loss of offsite power. The finding

was of very low safety significance (Green) because it was not a design or qualification deficiency, did not involve an actual loss of safety system, did not represent actual loss of a safety function of a single train for greater than its TS allowed outage time, and did not represent an actual loss of function of one or more non-Tech Spec Trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for >24 hours.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

P. Gardner, Site Vice President
K. Scott, Site Operations Director
C. Dieckmann, Plant Manager
M. Antony, Operations Manager
M. Lingenfelter, Director of Engineering
R. Olson, Maintenance Manager
S. Quiggle, Chemistry Manager
C. England, Radiation Protection Manager
T. Hedges, RP General Supervisor
A. Ward, Regulatory Affairs Manager
P. Young, Nuclear Program Engineering Manager
R. Garding, Program Engineering Supervisor
T. Jones, Engineering Analyst Principal
R. Deopere, Engineering Analyst Principal
R. Loeffler, Regulatory Affairs

U.S. Nuclear Regulatory Commission

B. Dickson, Chief, Reactor Projects Branch 2
P. Zurawski, Senior Resident Inspector
D. Krause, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

5000263/2017-001-00	LER	Reactor SCRAM and Group II Isolation Due to 11 Reactor Feed Pump Removal from Service with 12 Reactor Feed Pump Isolated
5000263/2017-002-00	LER	Main Steam Isolation Valve Closure Time Outside Technical Specification Requirements
5000263/2017-003-00	LER	Main Steam Isolation Valve Leakage Exceeds Technical Specification Requirements
5000263/2017002-01	NCV	Low Reactor Water Level During Shutdown of 11 Reactor Feedwater Pump

Closed

5000263/2017-001-00	LER	Reactor SCRAM and Group II Isolation Due to 11 Reactor Feed Pump Removal from Service with 12 Reactor Feed Pump Isolated
5000263/2017002-01	NCV	Low Reactor Water Level During Shutdown of 11 Reactor Feedwater Pump

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

1R01 Adverse Weather

- 1150; Summer Checklist; Revision 72
- 4 AWI-04.02.01; Revision 28
- A.6; Acts of Nature; Revision 56

1R04 Equipment Alignment

- 2124; Plant Prestart Checklist, Diesel Generators and Fuel Oil System; Revision 10
- 2154-14; Master Valve Checklist, Diesel Oil System; Revision 20
- 2154-28; Master Valve Checklist, Diesel Generator Air Start System; Revision 12
- B.09.08-05; Ops Manual, Diesel Generators, System Operation; Revision 50
- CAP 1548357; G-3B (12 EDG) Engine Block to Foundation Bolt Found Loose
- CAP 1548728; Union Above 12 EDG Circulating Oil Pump has Leak
- CAP 1555802; RHR-30-2 Handwheel Stem Nut Missing
- CAP 1558443; Lower 4 KV Door #201 Handle Broken
- CAP 1558579; Foreign Material on Floor B RHR Room
- CAP 1560631; Leaky Lower Sight Glass 14 RHR Pump Motor
- CAP 1561401; V-CH-27, 4 KV Switchgear Room Chiller, Cooling Problem
- NH-36051; P&ID Diesel Oil System; Revision 87
- NH-36247; P&ID Residual Heat Removal System; Revision 88
- NX-8875-31; 4KV Switchgear Bus #13 & #15; Revision 79
- NX-9216-4; MNGP Air Starting System; Revision E

1R05 Fire Protection

- A.3-02-A; Fire Zone 2-A Strategy, RCIC Room TIP Drives; Revision 5
- A.3-02-E; Fire Zone 2-E Strategy, TIP Drive Cubicle; Revision 4
- A.3-02-F; Fire Zone 2-F Strategy, Main Steam Chase; Revision 4
- A.3-02-G; Fire Zone 2-G Strategy, East Shutdown Cooling; Revision 5
- A.3-02-H; Fire Zone 2-H Strategy, West Shutdown Cooling; Revision 8
- A.3-12-C; Fire Zone 12-C Strategy, Condenser; Revision 11
- A.3-200-H; Fire Zone 200 Strategy, Drywell; Revision 3
- CAP 1550323; Recommendations from NOS Fire Triennial Readiness Assessment
- CAP 1556045; Combustibles not Included in Fire Permit Found in the Plant
- CAP 1556535; Unaccounted for Combustibles in Fire Zone 3D

1R06 Flooding

- DBD T.08; Design Basis Document for Internal Flooding; Revision 4
- NF-74413-4; Underground Services Electrical Power; Revision 95
- NF-74413-6; Underground Services of Division II Cable Raceway System; Revision 80
- WO 546856-01; Mechanical Underground Vaults for Water Inspection; June 1, 2017

1R08 Inservice Inspection Activities

- 2017MT001; MT of N-2, RHR Heat Exchanger A, Shell-Pad-Noz; April 20, 2017
- 2017MT002; MT of WA, Core Spray Pump Support; April 21, 2017
- 2017MT003; MT of N-2, RHR Heat Exchanger A, Shell-Pad-Noz; April 25, 2017
- 2017MT004; MT of N-1, RHR Heat Exchanger A, Shell-Pad-Noz; April 26, 2017
- 2017UT008; UT of W-1, Core Spray A, Valve to Pipe; April 25, 2017
- 2017UT009; UT of W-2, Core Spray A, Pipe to Pipe; April 24, 2017
- 2017VT064; Containment Spray Support H-2; April 21, 2017
- 2017VT065; Containment Spray Support H-3; April 21, 2017
- 4AWI-09.04.03; ASME Section XI Repair / Replacement Program; Revision 23
- B31-P1P1-GTSM-001; Welding Procedure Specification; Revision 2
- B31-P1P8-GTSM-013; Welding Procedure Specification; Revision 4
- B31-P8P8-GTSM-037; Welding Procedure Specification; Revision 5
- BOP-MT-17-007; Magnetic Particle Examination Report, WO 561073-08; April 11, 2017
- BOP-MT-17-009; Magnetic Particle Examination Report, WO 561073-01; April 20, 2017
- BOP-PT-15-069; Liquid Penetrant Examination, AO-2561B, 2" Socket Weld; June 19, 2015
- BOP-PT-17-028; Liquid Penetrant Examination Report, WO 467478-03-01; April 20, 2017
- BWRVIP; BWRVIP Inspection Plan; Revision 5
- CAP 1375496; ISI-IVVI with Cleaning of H8-H9 Welds Confirms Indications
- CAP 1476394; RFO27 IVVI, Indications at H-8 at 68 Degree Remains Unchanged
- CAP 1476395; RFO27 IVVI, Indications at H-9 at 142 Degree Remains Unchanged
- CAP 1476969; FME Found in a Highly Contaminated Pipe
- CAP 1477254; Chain from Chain Fall Fell into Reactor Cavity
- CAP 1477790; RFO27 IVVI, New Indications on Access Hole Covers
- CAP 1478720; RFO27 IVVI, Indications at H-8 at 218 Degree Remains Unchanged
- CAP 1478721; RFO27 IVVI, Indications at H-9 at 292 Degree Remains Unchanged
- CAP 1478744; RFO27 IVVI, H8-H9 Weld Non-cleaned Locations Unchanged
- CAP 1505696; V-AC-8A, HPSI Room Cooler Has a Cooling Coil Leak
- CAP 1509469; V-AC-8A Cooling Coil Leaking
- CAP 1556336; RF08 ISI Indication
- CAP 1559160; ISI INSP Enhancement for NDE Pre-job Brief
- FP-PE-NDE-300; Dry Magnetic Particle Examination – Yoke/Coil; Revision 2
- FP-PE-NDE-401; Ultrasonic Examination of Ferritic Pipe Welds – Supplement 3; Revision 8
- FP-PE-NDE-530; Visual Examination, VT-3; Revision 8
- PDQS No. 858; PDI-UT-1, Performance Demonstration Initiative Program; Revision F
- WO 522626; Replace Drywell Equipment Drain Sump Outboard Isolation Valve AO-2561B
- WO 562376; RF028 ISI Indication
- WPS FP-PE-B31-P1P1-GTSM-001; Groove Welds and Fillet Welds, P1-P1, GTAW/SMAW, Without PWHT; Revision 3

1R11 Licensed Operator Regualification

- 2204; Plant Shutdown; Revision 67
- 2204; Plant Shutdown; Revision 68
- 2300; Reactivity Maneuvering Steps; (Reactor Shutdown; April 10-15, 2017); Revision 0
- 2300; Reactivity Maneuvering Steps; (Reactor Startup; May 12-20, 2017); Revisions 0-2;
- April 15, 2017
- B.03.04-05; Residual Heat Removal System; Revision 82
- B.06.05-05; "B" Ops Manual Section D.6, Part A (Continued), Condensate and Reactor Feedwater System; Revision 51

- B.06.05–05; “B” Ops Manual Section F.1, Shutdown of the Condensate and Reactor Feedwater System; Revision 52
- BOC–29 Startup – Thermal Power Profile: No Date
- Calculation 2017–04–12 11:00:14; Gardel Core Shutdown Predictive Case; April 12, 2017
- Calculation 2017–04–12 11:02:09; Gardel Power–Flow Map Predictive Case; April 12, 2017
- Calculation 2017–04–12 11:56:28; Gardel Core Shutdown Predictive Case; April 12, 2017
- CAP 1555785; Apparent Cause Evaluation – Reactor Water Level Transient During Shutdown of 11 RFP for RFO 28; Revision 0
- CAP 1555785; Rx Water Level Transient During Shutdown of 11 RFP for RFO 28
- FP–OP–COO–01; Conduct of Operations; Revision 19
- FP–OP–COO–21; Reactivity Control; Revision 3
- MTCP–03.47; Operations Continuing Training Plan Guide; Revision 6
- Operational Logs; April 15, 2017
- OWI–01.05; Conduct of Training; Revision 38
- OWI–01.06; Duty Operations Personnel Requirements and Responsibilities; Revision 58

1R12 Maintenance Effectiveness

- 0255–08–IA–1; RCIC Quarterly Pump and Valve Tests; Revision 73
- 4 AWI–09.04.01; Inservice Testing Program; Revision 51
- 4900–01–PM For Limitorque Motor Operated Valves; Revision 39
- 4907–PM; Inspection PM for Reliance AC Motors with Magnesium Rotors; Revision 1
- 98–011; Environmental Qualification (EQ) for Barton Pressure Switches; Revision 0
- B.02.03–03; Ops Manual Reactor Core Isolation Cooling; Revision 15
- B.02.03–04; Ops Manual Reactor Core Isolation Cooling; Revision 36
- B.05.06–06; Ops Manual Plant Protection System; Revision 14
- CAP 1557779; MO–2029 Will Not Go Into Manual Operation; May 7, 2017
- DBD–B.02.03; Reactor Core Isolation Cooling System; Revision 78
- NSP–0580; Relief Valve Setpoint and Leak Checks; Revision 7
- OSPO–RCI–0060; RCIC Hi Steam Flow Pressure Sensor Test and Calibration; Revision 7
- WO 533647; MO–2029–Perform 4907–PM: Magnesium Rotor Inspection
- WO 533647–01; PMT for MO–2029 Rotor Inspection; May 4, 2017
- WO 533647–02; MO–2029 – Perform 4907–PM: Magnesium Rotor Inspection; May 4, 2017

1R13 Maintenance Risk Assessment and Emergent Work

- 0255–07–IA–2; Main Steam Isolation Valve Functional Checks Test; Revision 34
- 0255–19; Snubber Inspection; Revision 25
- 0465–01; Emergency Filtration Treatment System; Revision 47
- 4603; Relay Bench Testing Form; Revision 2
- 7004; OB MSIV Testing; Revision 2
- 8036; Air In-leakage Search Procedure; Revision 7
- CAP 1503124; AO–2–86D (14 OTBD MSIV) Slow to Close
- CAP 1555798; “D” Outboard MSIV Closing Time Out of Band
- CAP 1555866; Two Snubbers Identified with Leakage during the 0255–19
- CAP 1555986; RV–27A–H9 Failed As-Found Bench Test
- CAP 1558832; Unexpected Increase in RBV WRGM “A” Reading
- CAP 1558859; Off–Gas Flow Elevated, Off–Gas Storage Bypassed
- CAP 1559370; ODCM–03.01 7 Day Limit Exceeded
- CAP 1560344; In-leakage Identified during 8036 Procedure
- CAP 501000000051 (CAP #34); VD–9111B Failed to Open

- EC 28507; Operational Test Failure of RV-27A-H9; May 30, 2017
- EC 28604; Past Operability Review for Snubber RV-27A-H9; May 11, 2017
- EC 28669; Patch on Outboard D300-3/4"-EF Line to HP CDSR (Penetration 22); June 5, 2017
- Manual Work Request 2017-01; EFT Filter V-FE-12 Discharge Damper; June 22, 2017
- ND-111264-1; Steam Seal Header Piping, Line D300-3/4-EF; Revision A
- NE-93504-10; Emergency Filter Fan Unit V-EFT-12 Control; Revision F
- NE-93504-14; Damper VD-9111B Control; Revision C
- NH-36241; Nuclear Boiler System – Steam Supply; Revision 88
- ODCM 03.01; Gaseous Effluents; Revision 14
- QF0450; ECE - "D" Outboard MSIV Closing Time Out of Band; June 7, 2017
- QF-1146; "B" EFT Past Operability Review; June 27, 2017
- WO 00533768; Main Steam Isolation Valve Functional Checks Test; May 9, 2017
- WO 00533939; 0255-19, Snubber Inspection; May 5, 2017
- WO 00543133; Perform 8036, Condenser Air In-leakage Test; June 5, 2017
- WO 00562317; "D" Outboard MSIV Closing Time Out of Band; May 11, 2017
- WO 00563771; Seal Manways in Condenser Hotside; June 5, 2017

1R15 Operability Evaluations

- 0255-06-IA-1; HPCI Quarterly Pump and Valve Tests; Revision 100
- 1069; HPCI Flow Control System Dynamic Test Procedure; 0255-06-IA-1
- 4 AWI-04.05.20; Leak Management Process; Revision 4
- 4111-PM; HPCI Coupling and Alignment Checks HPCI Turbine Oil Filter Changeout; Revision 24
- CAP 1558451; P-208B, #12 Core Spray Pump Seal Water Supply Line Leak
- CAP 1558451; Past Operability Review
- CAP 1558451; Reportability Determination Evaluation
- CAP 1559822; Drywell Nitrogen Inventory Trent Not in Accordance with Other Indications
- CAP 1559822; Prompt Operability Determination (Drywell Nitrogen Inventory)
- CAP 1559828; HCU-38-27, CRD-111 Valve Leaks Nitrogen
- CAP 1559828; Prompt Operability Determination (HCU 38-27)
- NH-36248; P&ID Core Spray System; Revision 86
- WO 527430-02; OPS-PMT-HPCI Oil Relay (Below HO-7); Revision 0
- WO 563404; P-208B; #12 Core Spray Pump Seal Water Supply Line Leak; May 11, 2017
- WO-02; VD-9111B, PMT

1R18 Modifications

- 0067-0075-CALC-007 (16-043); Evaluation of RCIC System Vent Line; Revision 0
- 16-0128; 50.59 Screening-TSTF 523, ECC High Point Vents; Revision 0
- MNGP-189452-02 (16-047); Evaluation of HPCI Vent Line V136-2"-ED; Revision 0
- MNGP-189452-P03 (16-048); Evaluation of HPCI Vent Lines V134 & V135-1/2, 2"-ED; Revision 0
- MNGP-189452-P04 (16-049); Evaluation of RCIC Vent Line V133-2"-ED; Revision 1
- MNGP-189452-S01 (16-050); Evaluation of Core Bores in West Wall of Steam Case; Revision 0
- MNGP-189452-S02 (16-051); Evaluation of Core Bore in West Wall of Reactor Building; Revision 0
- USAR-06-02; Emergency Core Cooling System (ECCS); Revision 34

1R19 Post Maintenance Testing

- 0255-04-IA-2; RHR System – Cold Shutdown Valve Operability Tests; Revision 30
- 4900-01-PM For Limitorque Motor Operated Valves; Revision 39
- 4907-PM; Inspection PM for Reliance AC Motors with Magnesium Rotors; Revision 1
- 7758; SRM/IRM Detector I-V Curve Procedure; Revision 8
- CAP 1270065; SRM and IRM Signal Cables not installed per Drawing
- CAP 1474430; IRM-14 IV Failed to Obtain an Acceptable IV Curve per 7758
- CAP 1479532; 1R27 RCS Leakage Test—MO-2-53B
- CAP 1556639; LLRT-IST Failure of HPCI-15
- CAP 1557577; MO-2-53B Packing Leak
- CAP 1557650; Approximately 1 Gallon Demin Water Leak During HPCI LLRT
- CAP 1557779; MO-2029 Will Not Go Into Manual Operation; May 7, 2017
- CAP 1561328; MTS-6-84B Appears to Emit High Pitch Tone
- CAP 1561420; MTS-6-84B (B FWRV Controller) Emitting a High Pitch Noise
- NH-36250; High Pressure Coolant Injection System; Revision 84
- WO 00426916; Replace IRM-12, IRM-14, and SRM-22 Undervessel Cables; April 27, 2017
- WO 00490975; PM 4900-1 for MO-2029, PMT/RTS; May 4, 2017
- WO 00521535; 0255-09-IA-2, Recirculation System Cold Shutdown Tests; April 29, 2017
- WO 00521769; 02555-06-IA-8, HPCI Cold Shutdown Check Valve Test, PMT of HPCI-31; May 5, 2017
- WO 00533532; 0255-09-IA-3, Recirculation System Refuel Test; April 29, 2017
- WO 00533792; MO-2-53B, Perform Mech Portions of 4900-01-PM, PMT; April 28, 2017
- WO 00565239; MTS-6-84B Appears to Emit High Pitch Tone, Replace Controller/PMT; June 26, 2017
- WO 533647; MO-2029-Perform 4907-PM: Magnesium Rotor Inspection
- WO 533647-01; PMT for MO-2029 Rotor Inspection; May 4, 2017
- WO 533647-02; MO-2029 – Perform 4907-PM: Magnesium Rotor Inspection; May 4, 2017

1R20 Refueling and Outage

- (Phase 1.hdf5); April 6, 2017
- (Phase 2.hdf5); April 13, 2017
- 2140; De-Inerting Primary Containment; Revision 33
- 2165; SCRAM Report; Revision 33
- 2167; Plant Startup; Revision 95
- 2204; Plant Shutdown; Revision 67
- 2270; Critical Safety System Checklist; Revision 13
- 2300; Reactivity Adjustment; Revision 19
- 4 AWI-08.15.03; Risk Management for Outages; Revision 13
- 9007-B; Shift Supervisor's Refueling Checklist; Revision 20
- 9203; Remove Reactor Well Shield Blocks; Revision 30
- 9207; Remove Drywell Head; Revision 23
- 9210; Master RPV Disassembly Procedure; Revision 22
- 9220; Remove RPV Head; Revision 26
- 9292; Clean Reactor Pressure Vessel Head Flange and Replace O-Rings; Revision 16
- Badge Access Transaction Reports for Selected Individuals between dates April 13, 2017 and May 5, 2017
- CAP 1554787; NRC Identified Housekeeping Items
- CAP 1555515; Door-124 Alarm Received
- CAP 1555681; RCIC P-211 Barometric Cond Vac Pump Leak Along Motor Shaft

- CAP 1555685; HPCI LS-23-90 Lower Root Isol Valve I-HPCI-7 Steam Leak
- CAP 1556190; RP Posting Discrepancies Noted During Walkdown
- CAP 1556316; Issues with an Air Compressor Grade Test Result
- CAP 1557589; Refuel Bridge ARM Found Unplugged
- CAP 1557843; Work Hour Waivers Initiated to Support SDC Restoration
- CAP 1557880; NRC Identified Question Concerning Boot Expansion Joints
- CAP 1558017; NRC Question Regarding Calculation Methodology
- CAP 1558080; Numerous Small Areas of Primary Containment failed Acceptance Criteria
- CAP 1558185; Leaks During 0255-20-IIC-2 RCS Pressure Test RFO 28
- CAP 1558230; Contaminated Area Sign Found Not Properly Orientated
- FP-S-CWH-01; 10CFR26 Calculating Work Hours; Revision 3
- FP-S-FAP-01; 10CFR26 Fatigue Assessment Procedure; Revision 2
- FP-S-FFD-01; Monticello/Prairie Island Fitness for Duty Programs; Revision 6
- FP-S-FMP-01; 10CFR26 Fatigue Management Fleet Procedure; Revision 5
- Monticello Nuclear Generating Plant Shutdown Safety Plan Refueling Outage 28; March 15, 2017
- QF1725; 10CFR26 Fatigue Assessment Form; Revision 2
- QF1727; 10CFR26 Work Hour Limits Waiver; Revision 2
- Sequence A2R5 Notebook; May 9, 2017
- WO 533482; 9210-Master RPV Disassembly; April 20, 2017
- WO 533484-01; 9207-Remove Drywell Head; April 16, 2017
- WO 533487; 9220-Remove RPV Head; April 20, 2017
- WO 533549-01; Monticello Nuclear Generating Plant RFO28 Fuel Move Sheets;
- WO 533549-01; Monticello Nuclear Generating Plant RFO28 Fuel Move Sheets;
- WO 533646-02; Perform Insp/Minor Repairs to CWT CDST XJS; April 28, 2017
- WO 533733; 0140 Drywell Interior Surface Inspection; May 10, 2017

1R22 Surveillance Test

- 0255-20-IIC-2; Reactor Coolant Pressure Boundary Leakage Test; Revision 41
- 0016; Rx Mode Switch in Shutdown SCRAM Test; Revision 15
- 0081; Control Rod Drive SCRAM Insertion Time Test; Revision 71
- 0151-01; Secondary Containment Capability Test; Revision 25
- 0255-06-IA-1; HPCI Quarterly Pump and Valve Tests; Revision 100
- 0255-17-IA-1; Instrument Air System Valve Exercise; Revision 42
- 07-034; May 01, 2017
- 1043-03; Turbine Generator Overspeed Trip Tests; April 16, 2017
- 3108; Pump/Valve Instrument Record of Corrective Action, HPCI MO-2036, May 10, 2017; Revision 17
- 3560; Infrequent Test or Evolution Briefing Guide; Revision 12
- CAP 1542376; MO-2036, HPCI Turbine Steam Supply, Steam Leak from Packing
- CAP 1547140; Track Turbine Generator Transients
- CAP 1547775; MO-2036 has Seat Leakage, Causing Elevated Temps Downstream
- EC 28464; SBGT Planned Leakage Excess Capacity for Cycle 29 using Methodology of 07-034
- OSP-ECC-0566; Low Pressure ECCS Automatic Initiation and Loss of Auxiliary Power Test; Revision 17
- Technical Specifications SR 3.3.1.1.10; RPS Instrumentation; Amendment No. 176
- Technical Specifications SR 3.3.3.1.2; PAM Instrumentation; Amendment No. 146
- WO 00533427; 0151-01, Secondary Containment Capability Test; April 16, 2017
- WO 00533702; 0016 Rx Mode Switch in Shutdown SCRAM Test; April 15, 2017

- WO 00533910; 1043-03, TRB GEN Overspeed Trip; April 16, 2017
- WO 00550122; 0255-17-IA-1, Instrument Air System Valve Exercise; April 6, 2017
- WO 0055718; MO-2036 Has Seat Leakage, Causing Elevated Temps Downstream; May 13, 2017
- WO 633487; 0255-20-IIC-2 RX Coolant Press Boundary Leakage Test; May 8, 2017

2RS1 Radiological Hazard Assessment and Exposure Controls

- Annual NSTS Inventory Reconciliation – 2017; January 23, 2017
- CAP 1524687; Key Control not IAW with Procedure
- CAP 1532845; Cognitive Trend in Contamination in Unposted Areas
- CAP 1534276; Rad Mat Labeling Issues Noted
- CAP 1551578; Unexpected Dose Rate Alarm
- CAP 1553747; Housekeeping Challenges to LHRA Barriers Identified
- CAP 1555978; Cavity Air Sample Indicated >0.3 DAC During Dome Removal
- CAP 1556190; RP Posting Discrepancies Noted on Walkdown
- ED Dose and Dose Rate Alarm Evaluations; Various Records
- FP-RP-AM-01; Alpha Monitoring Program; Revision 5
- FP-RP-SEN-02; Radiological Work Planning and Controls; Revision 5
- General Area Alpha Classification Data; 2015-2017 Data
- R.12.02; Radiation Protection Key Control; Revision 35
- Radioactive Source Inventory and Leak Test; January 2017
- Radiological Air Sample Records; Various Records
- Radiological Surveys; Various Records
- RWP 175122; iR28 RWCU MO 2398; Replacement Activities; Revision 0
- RWP 175502; VHRA Downposting/Initial Entry Activities; Revision 0
- RWP 175509; CRD Changeout; Revision 0
- Self-Assessment; NRC Inspection Procedure 71124.01; December 1, 2016–January 20, 2017
- Unconditional Release Gamma Spectroscopy Records; Various Records

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls

- 2RS3 In-Plant Airborne Radioactivity Control and Mitigation
- CAP 1475363; Lapel Air Samplers not Set-Up Correctly
- CAP 1495441; OEE: Results, No Procedure Requiring 15 year Overhauls
- CAP 1534945; Condenser Room Posted as Airborne Area
- CAP 1549261; NOS ID CE Lacks Details to Support Conclusions; February 1, 2017
- CAP 1556236; Unapproved Vendor Respirators Discovered
- CAP 1556316; Issues with an Air Compressor Grade Test
- Grade D Air Test Records; Various Records
- MO 2398 Replacement Activities RP Job Plan; Revision 0
- MSA Flow Test Records; Various Records
- MSA SCBA Functional Check Records; Various Records
- NMC Letter; Request for Approval of Use of Delta Protection Respiratory Protection Equipment; October 20, 2005
- RP-GP-01.23; ALARA Planning Group; Revision 4
- SCBA Qualification Records; Various Records
- Station ALARA Committee Meeting Information; April 15, 2017

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

- 4 AWI-08.04.04; Respiratory Protection; Revision 19
- R.02.03; Airborne Radioactivity Sampling; Revision 20
- R.05.04; Supplied Air Respiratory Usage; Revision
- Self-Assessment NRC Inspection Procedure 71124.03; December 1, 2016–January 20, 2017

2RS4 Occupational Dose Assessment

- 4 AEI-08.04.02; Personnel Exposure Monitoring and Control; Revision 21
- CAP 1465111; Corrected TLD Background Used for Third Quarter of 2014 Results
- CAP 1474258; 12 Neutron EDs Failed Neutron Calibration as Found Readings
- CAP 1474259; Incorrect Dose Assignment and Personnel Data in Sentinel
- FP-RD-DP-01; Dosimetry Program; Revision 9
- Internal Radionuclide Uptake Evaluations; Various Records
- NRC Form 5 Occupational Dose History Forms; Various Records
- Prospective Dose Assessment and Dose Reporting Threshold Summary; April 10, 2017
- R.09.23; TLD Spiking Test; Revision 12
- Self-Assessment NRC Inspection Procedure 71124.03; December 1, 2016—January 20, 2017
- Whole Body Counter Radionuclide Library; April 19, 2017

4OA1 Performance Indicator Verification

- 0388-01; Containment Sump Leakage Measurement Instrumentation; Revision 19
- 0533; Containment Sump Flow Measurement Instrumentation; Revision 27
- 0533; Containment Sump Flow Measurement Instrumentation; Revision 28
- 0533; Containment Sump Flow Measurement Instrumentation; Revision 29
- FP-PA-PI-01; Performance Indicator Control; Revision 12
- FP-PA-PI-02; NRC/INPO/WANO Performance Indicator Reporting; Revision 12
- FP-R-PI-01; Preparation of NRC Performance Indicators; Revision 6
- Monticello Station Log Entries; April 2016 through March 2017
- NE 99-02; Regulatory Assessment PI Guideline; Revision 7
- PRA-CALC-05-003; MSPI Basis Document; Revision 6
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (April 2016); May 10, 2016
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (May 2016); June 7, 2016
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (June 2016); July 6, 2016
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (July 2016); August 10, 2016
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (August 2016); September 2, 2016
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (September 2016); October 4, 2016
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (October 2016); November 7, 2016
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (November 2016); December 8, 2016
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (December 2016); January 10, 2017
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (January 2017); February 7, 2017

- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (February 2017); March 3, 2017
- QF-0445; NRC Data Collection and Submittal – RCS Total Leakage (March 2017); April 3, 2017
- - QF-0445; NRC Data Collection and Submittal – Safety System Functional Failures (April 2016); No Date
- QF-0445; NRC Data Collection and Submittal – Safety System Functional Failures (May 2016); No Date
- QF-0445; NRC Data Collection and Submittal – Safety System Functional Failures (June 2016); July 7, 2016
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- QF-0445; NRC Data Collection and Submittal – Safety System Functional Failures (September 2016); October 5, 2016
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- QF-0445; NRC Data Collection and Submittal – Safety System Functional Failures (December 2016); January 6, 2017
- QF-0445; NRC Data Collection and Submittal – Safety System Functional Failures (January 2017); February 8, 2017
- QF-0445; NRC Data Collection and Submittal – Safety System Functional Failures (February 2017); March 2, 2017
- QF-0445; NRC Data Collection and Submittal – Safety System Functional Failures (March 2017); March 29, 2017

40A2 Identification and Resolution of Problems

- CAP 1366406; OE: NRC Part 21 02-00 Anchor Darling Valve
- CAP 1372941; Double Disc Gate Valve Flowserve Part 21
- CAP 1373645; NRC Part 21 – 2013-09-00 Wedge Pin Failure in Anchor Darling
- CAP 1373645; Part 21 Evaluation – BWROG-TP-1300X, Recommendation to Resolve Flowserve 10CFR Part 21
- EC 25155; Evaluation of Pin Shear Strength for Anchor Darling Double Disc Valve MO-2030; Revision 0
- NX-9235-45; Monticello Nuclear Generating Plant 4"-900LB Double Disc Gate Valve Carbon Steel, Bolted Bonnet, Weld Ends; Revision D
- NX-17484; Monticello Plant Technical Manual: 3"-900, 4"-900 AND 8"-600 Class Double Disc Gate Valves; Revision 3
- Part 21 Flowserve to NRC; Wedge Pin Failure of an Anchor/Darling Double Disc Valve at Browns Ferry Nuclear Plant Unit 1; February 25, 2013
- WO 424838; Repair MO-2397 to Reduce Seat Leakage; April 19, 2013
- WO 440760; MO-2035 – Disassembly/Inspection; May 3, 2013
- WO 475009; Disassemble/Retorque Upper Wedge for MO-2071; May 21, 2013
- WO 543467; Replace MO-2398 Actuator to Resolve OBN; April 23, 2107

4OA3 Follow-Up of Events and Notices of Enforcement Discretion

- ACE 1555785; Rx Water Level Transient during S/D of 11 RFP for RFO28; Revision 1
- CAP 1555785; Rx Water Level Transient during S/D of 11 RFP for RFO28

4OA7 Licensee Identified Violations

- 2072; Operations Regulatory Requirements Briefing Guide; Revision 7
- CAP1554105; Technical Specification Action Statement Exited in Error
- Condition Evaluation 01554105-01; Technical Specification Action Statement Exited in Error; May 30, 2017
- Monticello Station Logs for March 27, 2017
- OWI-02.07; Operations Work Control; Revision 56
- OWI-03.02: Safety Related and Fire Protection Related system Operability Determination and Verification; Revision 22
- Technical Specification 3.7.1; Residual Heat Removal Service Water (RHRSW) System; Amendment No. 146

LIST OF ACRONYMS USED

ALARA	As-Low-As-Is-Reasonably-Achievable
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CDF	Core Damage Frequency
CFR	<i>Code of Federal Regulations</i>
HPCI	High-Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISI	Inservice Inspection
MT	Magnetic Particle Examination
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
OSP	Outage Safety Plan
PI	Performance Indicator
PM	Post Maintenance
RCS	Reactor Coolant System
RCIC	Reactor Core Isolation Cooling
RFO	Refueling Outage
RFP	Reactor Feed Pump
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RPS	Reactor Protection System
SCBA	Self-Contained Breathing Apparatus
SCRAM	Reactor Protection System Actuation
TS	Technical Specification
USAR	Updated Safety Analysis Report