



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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May 2, 2018

Mr. Joel P. Gebbie
Senior VP and Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: DONALD C. COOK NUCLEAR POWER PLANT, UNITS 1 AND 2—NRC
INTEGRATED INSPECTION REPORT 05000315/2018001 AND
05000316/2018001

Dear Mr. Gebbie:

On March 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Donald C. Cook Nuclear Power Plant, Units 1 and 2. On April 3, the NRC inspectors discussed the results of this inspection with yourself and other members of your staff. The results of this inspection are documented in the enclosed report.

Based on the results of this inspection, the NRC has identified two issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that two violations are associated with these issues. Because the licensee initiated condition reports to address these issues, these violations are being treated as Non-Cited Violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy. These NCVs are described in the subject inspection report.

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 Donald C. Cook Nuclear Power 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 Donald C. Cook Nuclear Power 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 Karla Stoedter Acting for/

Kenneth Riemer, Chief
Branch 2
Division of Reactor Projects

Docket Nos. 50-315; 50-316
License Nos. DPR-58 and DPR-74

Enclosure:
IR 05000315/2018001; 05000316/2018001

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Letter to Joel Gebbie from Kenneth Riemer dated May 2, 2018

SUBJECT: DONALD C. COOK NUCLEAR POWER PLANT, UNITS 1 AND 2—NRC
INTEGRATED INSPECTION REPORT 05000315/2018001 AND
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REGION III

Docket Numbers: 50-315; 50-316

License Numbers: DPR-58; DPR-74

Report Numbers: 05000315/2018001; 05000316/2018001

Enterprise Identifier: I-2018-001-0034

Licensee: Indiana Michigan Power Company

Facility: Donald C. Cook Nuclear Power Plant, Units 1 and 2

Location: Bridgman, MI

Dates: January 1 through March 31, 2018

Inspectors: J. Ellegood, Senior Resident Inspector
T. Taylor, Resident Inspector
R. Baker, Senior Operations Engineer
M. Holmberg, Reactor Inspector
T. Go, Health Physicist
G. Roach, Senior Operations Engineer
L. Smith, Reactor Inspector

Approved by: K. Riemer, Chief
Branch 2
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee’s performance by conducting an integrated quarterly inspection at the Donald C. Cook Nuclear Plant, Units 1 and 2 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. NRC and self-revealed findings, violations, and additional items are summarized in the table below.

List of Findings and Violations

Failure of Unit 1 Turbine Driven Auxiliary Feedwater Pump to Reach Rated Speed			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000315/2018001-01 Closed	P.5, Operating Experience	71111.15
A self-revealed finding of very low safety significance with an associated Non-Cited Violation of Technical Specification 5.4 “Procedures,” occurred on December 21, 2017, when the Unit 1 Turbine-Driven Auxiliary Feedwater Pump failed to reach rated speed during a surveillance. Procedure 12-MHP-5021-056-008, “Turbine-Driven Auxiliary Feedwater Pump Governor Valve Maintenance,” was not appropriate for the circumstances in that direction was not given to check that the governor valve could fully open following maintenance on the governor valve.			

Operation of Letdown System Leads to Voiding and Subsequent Relief Valve Lift			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000315/2018001-02 Closed	N/A	71111.20
The inspectors identified a finding of very low safety significance and associated Non-Cited Violation of Technical Specification 5.4, “Procedures,” when the licensee failed to maintain a procedure for operating the letdown system. As a result, a water-hammer occurred which caused a safety-related relief valve to lift, which discharged reactor coolant to the Pressurizer Relief Tank until letdown was isolated.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000315/2017004-02	Unit 1 Letdown System Safety Valve Lift During Preparations for Cooldown	71111.20	Closed
LER	05000316/2016-002-00	Emergency Diesel Generators Declared Inoperable due to a Manufacturing Design Issue	71153	Closed
LER	05000315/2017-001-00	Unit 1 Turbine Driven Auxiliary Feedwater Pump Inoperable for Longer Than Allowed by Technical Specifications	71153	Closed
LER	05000316/2017-001-00	Unit 2 Containment Hydrogen Skimmer Fan #1 Inoperable Longer than Allowed by Technical Specifications	71153	Closed

TABLE OF CONTENTS

PLANT STATUS	5
INSPECTION SCOPES	5
REACTOR SAFETY	5
RADIATION SAFETY	8
OTHER ACTIVITIES – BASELINE	9
INSPECTION RESULTS	10
EXIT MEETINGS AND DEBRIEFS	16
DOCUMENTS REVIEWED	16

PLANT STATUS

Unit 1 began the inspection period at 100 percent and remained at or near 100 percent for the entire inspection period.

Unit 2 began the inspection period at 100 percent power. On February 26, 2018, the licensee started a downpower in preparation for a refueling outage. On March 1, the licensee shut the unit down for refueling. Unit 2 remained shutdown for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards."

REACTOR SAFETY

71111.01—Adverse Weather Protection

External Flooding (1 Sample)

The inspectors evaluated readiness to cope with external flooding during the week of February 19, 2018.

71111.04—Equipment Alignment

Partial Walkdown (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Unit 1 East Control Air;
- (2) Spent Fuel Pool Cooling System;
- (3) 1AB Emergency Diesel Generator (EDG); and
- (4) East Diesel and Electrical Fire Pumps.

71111.05AQ—Fire Protection Annual/Quarterly

Quarterly Inspection (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Unit 2 CD 4KV Switchgear Room;
- (2) Unit 2 Switchgear Cable Vault;

- (3) Unit 2 Control Room; and
- (4) Unit 2 Control Room Cable Vault.

71111.06—Flood Protection Measures

Internal Flooding (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the Service Water Screen House.

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated simulator training on February 6, 2018, and Job Performance Measures (JPM) on February 7, 2018.

Operator Performance (1 Sample)

The inspectors observed and evaluated cooldown of the reactor on March 1, 2018.

Operator Exams (1 Sample)

The inspectors reviewed and evaluated requalification examination results on February 27, 2018.

Operator Requalification Program (1 Sample)

The inspectors evaluated the operator requalification program from January 15 through January 26, 2018.

71111.13—Maintenance Risk Assessments and Emergent Work Control (5 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Elevated risk associated with containment work, during the week of February 12, 2018;
- (2) Elevated risk associated with reduced inventory, during the week of March 5, 2018;
- (3) Elevated risk associated with Unit 2 dual train Essential Service Water (ESW) outage, during the week of March 19, 2018;
- (4) Emergent work to repair an air start relay on the 1CD EDG; and
- (5) Management of Unit 2 Accumulator levels and Technical Requirements Manual (TRM) compliance following Unit 2 cooldown.

71111.15—Operability Determinations and Functionality Assessments (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Containment Sump due to debris;
- (2) Past operability: Unit 1 Turbine Driven Auxiliary Feedwater Pump (TDAFP) failure to reach rated speed;
- (3) Repairs of 1CD EDG Air Start Check Valves; and

- (4) EDG Air Start Check Valves past operability.

71111.19—Post Maintenance Testing (4 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) 1CD EDG Air Start Relay replacement;
- (2) ESW valve 2–WMO–718 following torque adjustments;
- (3) 2AB EDG following outage maintenance activities; and
- (4) Unit 2 Reactor Trip Breaker Auxiliary Relay replacement.

71111.20—Refueling and Other Outage Activities (Partial Sample)

The inspectors evaluated Unit 2 refueling outage activities from March 1 through March 31, 2018. Specifically, the inspectors observed portions of the reactor shutdown and cooldown, toured containment, reviewed select clearances, and observed foreign material exclusion practices. Further, the inspectors reviewed other outage-related activities such as performance of reactor coolant instrumentation, electric power lineups, maintenance of containment integrity, decay heat removal system performance, coolant inventory control (including during a period of lowered inventory), performance of the spent fuel pool cooling system, portions of reactor disassembly, reactivity control, and removal of fuel from the core to the spent fuel pool. Because this outage remained in progress at the end of the inspection period, this does not yet constitute a complete sample.

As part of this review, the inspectors also closed out Unresolved Item (URI) 2017004–02, “Unit 1 Letdown System Safety Valve Lift During Preparations for Cooldown.”

71111.22—Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (3 Samples)

- (1) Unit 1 CD monthly load test;
- (2) Unit 2 Ice Condenser ice basket as-found weighing; and
- (3) Train ‘B’ Loss of Power/Loss of Cooling Accident testing during Unit 2 refueling outage.

In-service (2 Samples)

- (1) Unit 2 Turbine Driven Auxiliary Feedwater (TDAFW) System test; and
- (2) Power Operated Relief Valve (PORV) stroke time testing.

Containment Isolation Valve (1 Sample)

- (1) As-left local leak rate test on 2–XCR–101.

71114.06—Drill Evaluation

Emergency Planning Drill (1 Sample)

The inspectors evaluated an Emergency Planning training drill involving loss of fission product barriers on February 13, 2018.

RADIATION SAFETY

71124.01—Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

Instructions to Workers (1 Sample)

The inspectors evaluated worker instructions.

Contamination and Radioactive Material Control (1 Sample)

The inspectors evaluated contamination and radioactive material controls.

Radiological Hazards Control and Work Coverage (1 Sample)

The inspectors evaluated radiological hazards control and work coverage.

High Radiation Area and Very High Radiation Area Controls (1 Sample)

The inspectors evaluated risk-significant high radiation area and very high radiation area controls.

Radiation Worker Performance and Radiation Protection Technician Proficiency (1 Sample)

The inspectors evaluated radiation worker performance and radiation protection technician proficiency.

71124.02—Occupational As Low As Reasonably Achievable Planning and Controls

Implementation of As Low As Reasonably Achievable and Radiological Work Controls (1 Sample)

The inspectors reviewed ALARA practices and radiological work controls by reviewing the following activities:

- (1) RWP–171102; U1C28 Reactor Reassembly Activities; Revision 0;
- (2) RWP–171105; U1C28 Reactor Baffle Bolt Inspection and Repair Activities to Include Lower Internal Movements; Revision 4;
- (3) RWP–171142; U1C28 Containment Install. Modify and Remove Scaffold; Revision 0;
- (4) RWP 182105; Unit 2 C24 Reactor Baffle Bolt Inspection and Repair Activities to Include Lower Internal Movements; Revision 2;
- (5) RWP–182142; U2C24 Containment Install, Modify and Remove Scaffold ; Revision 0; and
- (6) RWP–182105; U2C24 Reactor Baffle Bolt Inspection and Repair Activities to Include Lower Internal Movements; Revision 1.

Radiation Worker Performance (1 Sample)

The inspectors evaluated radiation worker and radiation protection technician performance.

OTHER ACTIVITIES – BASELINE

71151—Performance Indicator Verification (10 Samples)

The inspectors verified licensee performance indicators submittals listed below

- (1) IE01: Unplanned Scrams per 7000 Critical Hours – 2 Samples (01/01/2017 – 12/31/2017);
- (2) IE03: Unplanned Power Changes per 7000 Critical Hours – 2 Samples (01/01/2017 – 12/31/2017);
- (3) IE04: Unplanned Scrams with Complications (USwC) – 2 Samples (01/01/2017 – 12/31/2017);
- (4) MS05: Safety System Functional Failures (SSFFs) – 2 Samples (01/01/2017 – 12/31/2017); and
- (5) BI01: Reactor Coolant System (RCS) Specific Activity – 2 Samples (01/01/2017 – 12/31/2017).

71152—Problem Identification and Resolution

Annual Follow-Up of Selected Issues (1 Sample)

- (1) Review of URI 05000315/2017004–02, Unit 1 Letdown System Safety Valve Lift during Preparations for Cooldown.

71153—Follow-Up of Events and Notices of Enforcement Discretion

Licensee Event Reports (3 Samples)

The inspectors evaluated the following licensee event reports which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) Retraction of Licensee Event Report (LER) 05000316/2016–002–00, “Emergency Diesel Generators Declared Inoperable due to a Manufacturing Design Issue,” via licensee letter AEP–NRC–2017–32. This issue was the subject of a previously documented finding of very low safety significance and Non-Cited Violation (NCV) (05000315/2017001–03; 05000316/2017001–03, Failure to Control Nonconforming Delivery Valve Holders on Emergency Diesel Generators). The inspectors did not identify any issues associated with the retraction.
- (2) Licensee Event Report (LER) 05000315/2017–001–00, “Unit 1 Turbine Driven Auxiliary Feedwater Pump Inoperable for Longer Than Allowed by Technical Specifications (TSs).” This issue is the subject of a finding with an associated NCV described in section 71111.15 of this inspection report. The inspectors reviewed the LER and determined there were no further findings or violations. The LER is closed. The inspectors documented one finding and associated violation related to this LER as 05000315/2018001–01.
- (3) Licensee Event Report (LER) 05000316/2017–001–00, Unit 2 Containment Hydrogen Skimmer fan #1 Inoperable Longer than Allowed by Technical Specifications on May 19, 2017. The inspectors documented one finding and associated violation related to this LER as 05000316/2017002–02. The inspectors reviewed the LER and determined there were no further findings or violations. The LER is closed.

INSPECTION RESULTS

71111.15—Operability Determinations and Functionality Assessments

Failure of Unit 1 Turbine Driven Auxiliary Feedwater Pump to Reach Rated Speed			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000315/2018001-01 Open/Closed	P.5, Operating Experience	71111.15
<p>A self-revealed finding of very low safety significance with an associated NCV of TS 5.4 “Procedures,” occurred on December 21, 2017, when the Unit 1 Turbine-Driven Auxiliary Feedwater Pump (TDAFP) failed to reach rated speed during a surveillance. Procedure 12-MHP-021-056-008, “TDAFP Governor Valve Maintenance,” was not appropriate for the circumstances in that direction was not given to check that the governor valve could fully open following maintenance on the governor valve.</p>			
<p><u>Description:</u></p> <p>On December 21, 2017, the licensee performed quarterly surveillance procedure 1-OHP-4030-156-017T, “Turbine Driven Auxiliary Feedwater System Test.” When started, the pump reached a speed of approximately 3500 RPM and then very slowly started to increase. Normally, the pump would quickly come up to the required speed of 4330-4370 RPM. After approximately one hour, pump speed had only reached 4000 RPM. Operator attempts to raise the speed were unsuccessful. The licensee secured the pump and declared it inoperable for the speed issue and started to investigate the failure.</p> <p>Initial troubleshooting by the licensee revealed binding in some parts of the governor valve linkage. Those issues were corrected, but the pump exhibited the same type of behavior as before when it was restarted. The licensee then replaced the governor, but that did not correct the problem. Further investigation revealed that a threaded rod making up part of the linkage appeared a little long compared to the Unit 2 pump and previous pictures of the Unit 1 pump. When the licensee adjusted this, they discovered the speed responded accordingly. The licensee adjusted the length to set the required speed, ran several surveillances to test the machine, and declared the pump operable. In the subsequent apparent cause evaluation, the licensee discovered that while adjusting the rod resolved the problem, the main issue was that the maintenance procedure did not direct validation of governor valve travel following completion of linkage setup per Electric Power Research Institute (EPRI) guidelines. This would help detect issues throughout the linkage between the governor and governor valve, if they existed, following reassembly of the linkage. The governor valve just had maintenance performed on it during the refueling outage which had concluded about one month prior. The apparent cause analysis determined the governor valve could not fully open due to an error in the linkage setup following that maintenance, which is why the machine did not reach full speed during the quarterly surveillance test.</p> <p>However, the machine had passed 1-OHP-4030-156-017T at the conclusion of the refueling outage as a post-maintenance test in November of 2017. Additionally, during troubleshooting after the failure, the machine was also able to pass 1-OHP-5030-156-017TV, “TDAFP Trip and Throttle Valve Test.” In their apparent cause evaluation, the licensee explored why the machine could pass these tests and not the quarterly test that resulted in the failure. When running 1-OHP-4030-156-017T during the outage, steam pressure was higher due to being</p>			

in Mode 3. In the 1-OHP-5030-156-017TV test, a different test loop in the system is used, so the required horsepower to achieve rated speed was reduced. Because of the different system conditions, the pump was able to pass those surveillances without the governor valve full open, but not the test on December 21. Adjustment of the threaded rod permitted additional travel of the governor valve thus allowing more steam admission to the turbine. The licensee assessed extent of condition and determined that prior to the outage for Unit 1 and during the current operating cycle for Unit 2, the TDAFPs had passed the quarterly surveillance. Therefore, this issue only impacted Unit 1 TDAFP operability following the maintenance window.

Corrective Action: The licensee adjusted the linkage to permit full travel of the governor valve. As part of the apparent cause evaluation, the licensee will assess various maintenance procedures for the necessary changes needed to ensure full governor valve travel following maintenance.

Corrective Action Reference: AR-2017-13059

Performance Assessment:

Performance Deficiency: Safety-related procedure 12-MHP-5021-056-008 was not appropriate to the circumstances in that it allowed reassembly of the governor valve linkage in a manner that precluded full governor valve travel. The procedure did not direct a check of governor valve travel. Had the governor valve been able to fully open as designed, the machine would have been able to pass all surveillances and be considered operable.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the Procedure Quality attribute of the Mitigating Systems cornerstone. Specifically, lack of the necessary detail in the procedure resulted in the Unit 1 TDAFP being inoperable until discovered during a routine surveillance approximately one month after work and testing had been performed on it.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, Exhibit 2. Per question A.3., the inspectors determined a detailed risk evaluation was required because the Auxiliary Feedwater (AFW) system was required by TS and a loss of function for greater than the TS allowed-outage time existed for the turbine-driven train of AFW. The train was inoperable from November 25, 2017, until December 23, 2017, which is beyond the 72 hours allowed by TS. Specifically, while the TDAFP could fulfill some of its PRA functions for the required mission times, it could not be relied upon for all the functions; namely, functions involving a cooldown to Mode 4 to satisfy certain accident analysis assumptions.

An NRC Senior Reactor Analyst modeled the impact of the performance deficiency by setting the basic event for the TDAFP failing to run at "True" in the DC Cook SPAR model. This was conservative from a risk assessment perspective because although the pump could be relied upon in some accident sequences (as described above), for the assessment it was assumed no functions could be performed. The fire results from the licensee's PRA model were then summed with the NRC's internal results. An exposure time factor (1 month/12 months) was applied to the result, since this was the time the pump was determined to be inoperable. The delta-CDF result was $7E-8$ (Green). Evaluation of Large Early Release Frequency was not required because the results were below the $1E-7$ threshold. Therefore, based on the

detailed risk analysis, the finding was determined to be of very low safety significance (Green).

Cross-cutting Aspect: The finding had a cross-cutting aspect in the Operating Experience component of the Problem Identification and Resolution cross-cutting area, which states that the licensee will systematically and effectively collect, evaluate, and implement relevant internal and external operating experience in a timely manner. Specifically, EPRI guidance for TDAFPs was not incorporated in station procedures which would have precluded the issue. In light of previous station issues with procedure quality and questions on operability related to the TDAFPs, the station did an assessment of EPRI guidance and researched other factors to ensure procedures were adequate for the TDAFPs in 2014 and 2015. The particular guidance for the governor valve was not incorporated. (P.5)

Enforcement:

Violation: TS 5.4, "Procedures," states, in part, that the applicable procedures recommended in Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operation)," are established, implemented, and maintained. Regulatory Guide 1.33 states, in part, that maintenance that could affect the performance of safety-related equipment should be performed in accordance with written procedures appropriate to the circumstances.

Contrary to the above, on November 25, 2017, safety-related procedure 12-MHP-5021-056-008 was not appropriate to the circumstances in that it allowed reassembly of the governor valve linkage in a manner that precluded full governor valve travel. In addition, the procedure did not direct a check of governor valve travel.

Disposition: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

71111.20—Refueling and Other Outage Activities

Operation of Letdown System Leads to Voiding and Subsequent Relief Valve Lift			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000315 /2018001-02 Open/Closed	N/A	71111.20
The inspectors identified a Green finding and associated NCV of TS 5.4, "Procedures," when the licensee failed to maintain a procedure for operating the letdown system. As a result, a water-hammer occurred which caused a safety-related relief valve to lift and discharge reactor coolant to the Pressurizer Relief Tank (PRT).			
<u>Description:</u>			
On September 13, 2017, Unit 1 had just been shutdown for the refueling outage and operators were preparing to start the cooldown. The operators lowered charging system flow in anticipation of reducing letdown flow, which would involve isolation of a 75 gpm letdown flow orifice. Less than five minutes later, as planned, the operator reduced letdown flow by isolating the 75 gpm orifice. Less than a minute after that, while trying to raise system			

pressure, operators received indications that the safety-related relief valve downstream of the regenerative heat exchanger in the letdown system had lifted and was discharging reactor coolant to the PRT. After pressure stabilized in the system, operators noted indications that the relief valve had not fully reseated. Because there is no direct measure of flow past the relief valve, operators calculated the continued leakage to the PRT to be approximately 12 gpm. This resulted in the operators declaring an Unusual Event, as the leakage was above the 10 gpm threshold. The operators isolated the letdown system, which stopped the continued loss of reactor coolant. The licensee established a multi-discipline team to review the event and determine actions needed to safely restore letdown and develop a better understanding of the conditions leading to the relief lifting. The inspectors also reviewed plant data to validate the licensee's conclusion. During this review, the inspectors recognized that thermodynamic conditions in the letdown system had reached saturation, and the pressure spike likely occurred from a steam bubble collapse causing a water-hammer. The inspectors informed the licensee of their concern. In response, the licensee performed a walkdown of the affected piping to ensure the piping had not been damaged. Prior to continuing the cooldown, the licensee manually cycled and reseated the relief valve, which allowed letdown to be restored. Additionally, a pressure transducer for a control valve in the system was calibrated, as it was initially suspected as being a potential cause for the pressure transient. Subsequent to these actions, the licensee successfully performed and completed the cooldown.

After the event, licensee personnel reviewed the data and recalculated the leak rate into the PRT. This reanalysis determined that the leak rate had not exceeded the threshold for the declaration of an Unusual Event. As a result, the licensee retracted the event notification. Licensee personnel developed several ideas for the cause of the transient but various organizations disagreed as to what the primary cause was. The inspectors discussed their concerns regarding the lack of a systematic assessment of the condition with licensee management. In the fourth quarter of 2017, the inspectors opened an Unresolved Item (05000315/2017004-02) after they reviewed licensee documentation in the Corrective Action Program (CAP) regarding this event and could not determine what, if any, performance deficiencies existed.

After discussing the issue with the inspectors, the licensee performed an Apparent Cause Evaluation (ACE) on the event in the current inspection period. The inspectors reviewed the ACE and their own data they had collected. The inspectors determined that a water-hammer event occurred in the system based on the temperatures and pressures that existed in the system when operators isolated the 75 gpm orifice. After isolation, pressure dropped (as expected). At that time, available data indicated temperature was above the point of saturation for the lowered pressure because of the reduction in charging flow performed by the operators right before the orifice was isolated. This led to steam bubble formation, and when pressure was adjusted by the operators, the bubbles collapsed, causing a pressure spike which lifted the relief valve. Subsequent inspection of the valve later in the outage revealed severe damage to the internals, which was likely the reason the valve did not reseat immediately once pressure was relieved. The inspectors determined safety-related procedure 1-OHP-4021-003-001, "Letdown, Charging, and Seal Water Operation" did not contain guidance on how to avoid saturation in the letdown system. The inspectors determined the issue was NRC-identified based on the inspector observations which led to a better understanding of the cause (via the ACE), and because of the early NRC observations which led the licensee to inspect the piping following the water-hammer.

Corrective Action(s): The licensee isolated the letdown system to stop the continued loss of coolant. Then, the relief valve was exercised to allow it to reseal. The letdown system was then restored to allow continued cooldown of the plant. After inspector questioning on how the event occurred, the licensee performed an ACE which recommended changes to procedures and pre-job briefs to address the potential for saturation conditions in the system.

Corrective Action Reference: AR-2018-0634

Performance Assessment:

Performance Deficiency: The inspectors identified that the licensee failed to maintain a procedure for operation of the letdown system that included precautions and limitations appropriate for a quality procedure as described in RG 1.33, "Quality Assurance Program Requirements (Operation)." Specifically, precautions and limitations associated with potential saturation conditions in the system were not included. The licensee is committed to RG 1.33 via TS 5.4, "Procedures," and operation of the letdown system is described as a safety-related process per RG 1.33. Further, the section of piping which experienced the pressure transient was safety-related.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the Procedure Quality attribute of the Initiating Events cornerstone. Specifically, a water-hammer occurred in the letdown system which resulted in damage to a safety-related relief valve, loss of primary coolant, and declaration of an Unusual Event (later retracted).

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, Exhibit 1. For question A.1., the inspectors determined the finding could not result in exceeding the leak rate for a small Loss Of Cooling Accident (LOCA) because the physical configuration of the system and procedural controls limit the maximum letdown flow to be within the capacity of the coolant charging pumps. For question A.2., the finding could not affect systems used to mitigate LOCAs because while the charging pumps are within the system, they are sufficiently isolated from the affected portion of the system by other components. Further, during an accident, the pump suctions would swap to a different source, which would isolate them from any leaks upstream. Based on these screening criteria, the finding screened to Green, or very-low safety significance.

Cross-cutting Aspect: No cross-cutting aspect was assigned to this finding, because the inspectors determined the finding did not reflect present licensee performance. Specifically, this procedure was in use for several years and the inspectors identified no recent opportunities nor operating experience that would have helped the licensee identify the procedural issue earlier. Additionally, the inspectors had no significant concerns with the operator response to this event.

Enforcement:

Violation: TS 5.4, "Procedures," states, in part, that the applicable procedures recommended in RG 1.33, "Quality Assurance Program Requirements (Operation)," are established, implemented, and maintained. Contrary to this requirement, safety-related procedure 1-OHP-4021-003-001 was not maintained. The site's Quality Assurance Program Description commits the site to ANSI Standard N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants," with regard to standards for plant operational procedures. The ANSI N18.7-1976/ANS-3.2 standard requires establishment of precautions to alert the individual performing a task to important measures used to protect equipment and personnel. Further, R.G. 1.33 stipulates that operation of the letdown system is a safety-related activity requiring operating procedures.

Contrary to the above, on September 13, 2017, the procedure did not address the precautions to preclude water-hammer in the letdown system via appropriate steps or precautions/limitations. This resulted in operation of the letdown system that caused a water-hammer and subsequent leakage of reactor coolant through a partially open relief valve on September 13, 2017. The leakage was stopped on the same day when operators isolated the letdown system.

Disposition: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

The disposition of this finding and associated violation closes URI 05000315/2017004-02.

71152—Problem Identification and Resolution

Observation—Review of URI 05000315/2017004-02, Unit 1 Letdown System Safety Valve Lift During Preparations for Cooldown.	IP 71152
<p>The inspectors performed a review of the licensee's follow-up regarding the lifting of a relief valve in the letdown system on Unit 1 during the Fall 2017 refueling outage. Details of the event are provided in the above-mentioned URI and in the finding which resulted from inspector review of the issue described below.</p> <p>After the plant had been stabilized following isolation of the letdown system, the inspectors noted that pressure/temperature conditions in the letdown system may have exceeded the saturation point. Given that, and the fact that the relief valve at lifted, the inspectors discussed the possibility of a water-hammer event having occurred in the letdown system. As a result, the licensee performed walkdowns of accessible piping to verify no damage had occurred. In terms of operator response, the inspectors did not identify any issues with how the operators controlled the plant following the lift of the relief valve.</p> <p>Regarding licensee evaluation of the event in the CAP, the inspectors provided several observations to the licensee. While the licensee did appropriately identify the issue and document it in the CAP in a timely manner, the licensee's resolution did not clearly identify the cause of the event. An AR existed for the fact the relief valve lifted, another AR documented saturation conditions may have existed, and another AR documented potential abnormal/erratic operation of a control valve in the system related to the event. In reviewing the AR's and in discussions with different licensee departments involved in reviewing the</p>	

event, the inspectors were unable to determine what, if any, performance deficiencies existed. Differing opinions existed between licensee departments. This resulted in the opening of the above-mentioned URI. Additionally, the inspectors were unable to determine if any of the corrective actions developed by the licensee were appropriate.

For this sample, the inspectors continued reviewing available plant computer data, current and previous revisions of the operating procedure for the letdown system, and had continuing discussions with operations personnel. Additionally, the inspectors reviewed the CAP for internal operating experience regarding similar events that may have happened. The inspectors identified a similar event on Unit 2 from 2004, but through further discussions with licensee personnel and review of additional plant computer data, the inspectors concluded that the 2004 event had occurred for reasons other than what have been described in the finding below. After discussing their observations with licensee personnel, the station elected to perform an Apparent Cause Evaluation (ACE) to ensure a systematic review was done. The inspectors reviewed the ACE and identified the finding discussed under Inspection Procedure 71111.20.

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure. No proprietary information was documented in this report.

- On April 3, 2018, the inspectors presented the inspection results to Mr. J. Gebbie, and other members of the licensee staff. The licensee acknowledged the issues presented;
- On January 26, 2018, the inspectors presented the biennial licensed operator requalification training (LORT) program inspection results to Mr. J. Gebbie, and other members of the licensee staff;
- On February 27, 2018, the inspectors presented the completed 2018 LORT annual operating test and biennial written examination inspection results to Mr. J. Clark, Licensed Operator Requalification Training Supervisor; and
- On March 23, 2018, the inspectors presented the ultimate radiation protection program inspection results to Mr. J. Gebbie, and other members of the licensee staff.

THIRD PARTY REVIEWS

The inspectors reviewed the Institute of Nuclear Power Operations (INPO) evaluation and assessment report discussing plant performance through September 2017.

DOCUMENTS REVIEWED

71111.-1 – Adverse Weather Protection

- 12-OHP-4027-FSG-1501; Flooding Response Deployment; Revision 0
- PMP-4027-FSG-003; Flex Program; Revision 7
- U2C24; Protected Area Laydown Map; 02/02/2018

71111.04—Equipment Alignment

- 02-OHL-5030-SOM-035; Unit 2 Tours – Unit 2 Outside Tour; Revision 30
- 12-OHP-4021-018-002; Placing in Service and Operating the Spent Fuel Pit Cooling and

Cleanup System; Revision 31

- 1-OHP-4021-064-001; Operation of Plant and Control Air; Revision 49
- 1-OHP-4030-132-027; AB Diesel Generator Operability Test (Train B); Revision 46
- AirCheck Report; 1-TK-39-DN/Control Air North Dry Air Receiver; 03/09/2017
- AirCheck Report; 1-TK-39-DN/Control Air North Dry Air Receiver; 06/05/2017
- AirCheck Report; 1-TK-39-DN/Unit 1 Control Air North Dry Air Receiver; 09/05/2017
- AirCheck Report; 1-TK-39-DS/Control Air South Dry Air Receiver; 03/09/2017
- AirCheck Report; 1-TK-39-DS/Control Air South Dry Air Receiver; 06/05/2017
- AirCheck Report; 1-TK-39-DS/Unit 1 Control Air North Dry Air Receiver; 12/04/2017
- AirCheck Report; 1-TK-39-DS/Unit 1 Control Air North Dry Air Receiver; 12/04/2017
- AirCheck Report; 1-TK-39-DS/Unit 1 Control Air South Dry Air Receiver; 09/05/2017
- AirCheck Report; 2-TK-39-DN/Control Air North Dry Air Receiver Unit 2; 12/05/2017
- AirCheck Report; 2-TK-39-DN/Control Air North Dry Air Receiver; 03/09/2017
- AirCheck Report; 2-TK-39-DN/Control Air North Dry Air Receiver; 06/05/2017
- AirCheck Report; 2-TK-39-DN/Unit 2 Control Air North Dry Air Receiver; 09/05/2017
- AirCheck Report; 2-TK-39-DS/Control Air South Dry Air Receiver; 03/09/2017
- AirCheck Report; 2-TK-39-DS/Control Air South Dry Air Receiver; 06/05/2017
- AirCheck Report; 2-TK-39-DS/Unit 2 Control Air South Dry Air Receiver; 09/05/2017
- AirCheck Report; 2-TK-39-DS/Unit Two Control Air South Dry Air Receiver; 12/06/2017
- AR 2016-9447; Boral Coupon Surveillance Missed Acceptance Criteria; 08/18/2016
- AR 2017-2747; Control Air Sample with 1 Particle >40 Microns; 03/29/2017
- AR 2017-3104; Control Air Sample Particulate Found >40 Microns; 03/21/2017
- NET-28047-02, D. C. Cook BORAL Coupon DD21085-1-4 Areal Density Amendment Report, 09/28
- OP-12-5152T-14; Flow Diagram Fire Protection – Water Piping in Pump House Floor Elevation 598' -0" Units 1 & 2; 03/19/2009
- OP-1-5151A-50; Flow Diagram Emergency Diesel Generator "AB" Unit No. 1; Revision 50
- OP-1-5151B-6; Flow Diagram Emergency Diesel Generator "AB"; Revision 61

71111.05AQ—Fire Protection Annual/Quarterly

- 12-FPP-2270-066-011; Attachment 3; Fire Watch Patrols; 02/11/2018
- 12-FPP-2270-066-011; Attachment 3; Fire Watch Patrols; 02/12/2018
- AR 2018-1494; Fire Barrier Penetration Seal F6327 Inoperable; 02/14/2018
- AR 2018-1819; Fire Seal W9993; 02/21/2018
- AR 2018-2376; 2-DR-AUX-463 Found Open; 03/05/2005
- AR 2018-3188; Through Hole Identified in Fire Seal Penetration W5065; 03/20/2018
- AR 2018-3450; Unit 1 Control Room Fire Penetration Requires Cap on Conduit; 03/26/2018
- D.C. Cook Fire Safety Analysis (FSA); Revision 2
- Fire Impairment log Report; 02-12-2018
- Fire Pre-Plans Volume 1; Revision 31
- Fire Pre-plans; Volume 1; Revision 31
- GT 2018-2027; Clarify 12-MHP-5021-EMP-003; 02/27/2018
- NFPPM; American Electric Power D. C. Cook Nuclear Plant; Revision 2

71111.06—Flood Protection Measures

- Cook Beyond Design Bases Flood Prevention Plan, Revision 1
- MD-12-Flood-019-N, Mitigating Strategies for Flooding, Revision 1
- MD-12-SCRN-001-N, Screenhouse Internal Flood Levels, Revision 3

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

- 2018 D. C. Cook Nuclear Power Plant Licensed Operator Requalification Program Crew B RO and SRO Biennial Written Examinations; 01/25/2018
- 2-OHP-4021-001-001; Plant Heatup from Cold Shutdown to Hot Standby; Revision 90
- 2-OHP-4021-001-003; Power Reduction; Revision 55
- ADMIN JPM RO-O-E123; Revision 7; 01/04/2018
- ADMIN JPM SR-O-N0010; Revision 2; 01/04/2018
- Annual Operating Examination Crew Simulator Evaluation; 'B' Shift; 01/24/2017
- Annual Operating Examination Individual Simulator Evaluation; 'B' Shift; 01/24/2017
- AR 2016-1308; Operability Determination Process; 02/03/2016
- AR 2016-13086; Delayed Notification of Unit 2 Refueling Water Storage Tank Level Below 35%; 11/01/2016
- AR 2016-14428; Shutdown Risk Near Miss; 12/16/2016
- AR 2016-5643; PMP-0610-OSD-001 Needs to Better Define Startup; 05/04/2016
- AR 2016-7865; Unit 2 Right Moisture Separator Reheater Expansion Joint Failure; 07/06/2016
- AR 2016-9545; Control Room Log Entries for 2-SRA-2900 Not Accurate; 08/16/2016
- AR 2016-9978; Operability Determination for 1-ERS-1400 Not Accurate; 09/02/2016
- AR 2017-11497; Control Room Log Entries Referencing Appendix R; 11/11/2017
- AR 2017-12804; Post Maintenance Test Not Performed in Correct Mode for 1-NRV-153; 12/13/2017
- AR 2017-12898; Plant Heatup Procedure Step was Incorrectly N/A'd; 12/18/2017
- AR 2017-12948; 1-NRV-153 Mistakenly Declared Operable; 12/19/2017
- AR 2017-2196; Action Way Corrective Actions Discrepancies from Apparent Cause Evaluation in 2015-3236-3; 02/22/2017
- AR 2017-4529; Control Room Log Entry for Unplanned Technical Specification Entry Not Bold; 05/03/2017
- AR 2018-0676; One Copy of an NRC Exam Simulator Scenario Could Not Be Located; 01/22/2018
- Closed Simulator Deficiency Records List from January 1; 2017 through January 23; 2018
- Donald C. Cook Nuclear Power Plant Design Function Time Critical Operator Actions
- Individual Operator Training Records-'B' Shift; Requalification Year 41
- OHI-2070; Operations Training and Qualification; Attachment 4; Active License Watchstanding Records; 'B' Shift Individuals for 3rd and 4th Quarters 2017
- Open Simulator Deficiency Records List; 01/23/2018
- PMP-7030-SFD-001; Safety Function Determination Program; Revision 9
- Remediation Packages for Licensed Operators; (various); Requalification Years 41 and 42
- RQ-S-4205-U2-T1; Period 4205 U2 Training Scenario 1; Simulator Exercise Guide; Revision 0
- SBT Package for Validation of Scenario RQ-E-ANN-21; Revision 2; 03/03/2017
- SBT Package for Validation of Scenario RQ-E-ANN-59; Revision 0; 03/13/2017
- SEG RQ-E-ANN-17; 01/04/2018
- SEG RQ-E-ANN-32; 01/04/2018
- SEG RQ-E-ANN-60; 01/04/2018
- SEG RQ-E-ANN-63; 01/22/2018
- Simulator Exercise Guide (SEG) RQ-E-ANN-6; 01/04/2018
- Simulator JPM RO-O-AEO-A006; Revision 1; 01/04/2018
- Simulator JPM RO-O-AEO-E005; Revision 3; 01/04/2018
- Simulator JPM RO-O-AEO-E281; Revision 2; 01/04/2018
- Simulator JPM RO-O-AEO-N202; Revision 2; 01/04/2018
- Simulator JPM RO-O-E007A-U12; Revision 0; 01/04/2018
- Simulator JPM RO-O-E022A-U12; Revision 0; 01/04/2018

- Simulator JPM RO-O-E107A-U12; Revision 0; 01/04/2018
- Simulator JPM RO-O-E279-U12; Revision 0; 01/04/2018
- TDG-SIM-005; Scenario Based Testing (SBT) Guideline; Revision 5
- Training Oversight Committee Agenda/Minutes; Discipline Committee: Operations Continuing Training; 04/07/2017
- Training Oversight Committee Agenda/Minutes; Discipline Committee: Operations Continuing Training; 07/19/2017
- TRP-2070 SIM-001; Simulator Configuration Control; Revision 11
- TRP-2070 SIM-003; Simulator Performance Testing; Revision 7
- TRP-2070-TAP-300-LOR; Licensed Operator Requalification Training Annual Operating Test and Biennial Written Examination Development; Revision 6
- TRP-2070-TAP-300-OPS; Operations Training Examination and Simulator Exercise Guide Development; Revision 17
- TRP-2070-TAP-400; SAT Implementation; Data Sheet 7: Remediation; Revision 28
- TRP-2070-TAP-400; SAT Implementation; Revision 28
- TRP-2070-TAP-400-LOR; Licensed Operator Requalification Training Annual Operating Test and Biennial Written Examination Implementation; Revision 5
- TRP-2070-TAP-400-SEC; Operations Training NRC Exam Security; Revision 7
- TRP-2070-TAP-OPS; Operations Training Implementation; Revision 48
- U1C28 Core Test; 11/16/2017
- U1C28 Steady State Test; 12/19/2017
- U1C28 Transient Test 11-Load Rejection; 11/28/2017
- U1C28 Transient Test 1-Manual Reactor Trip; 11/15/2017
- U1C28 Transient Test 3-Simultaneous Closure of All MSIVs; 11/28/2017
- U1C28 Transient Test 5-Trip of Reactor Coolant Pump #13; 11/15/2017
- U1C28 Transient Test 7-Maximum Power Rate Ramp 100%-75%-100%; 11/15/2017
- U2C23 Core Test; 07/01/2017
- U2C23 Steady State Test; 04/04/2017
- U2C23 Transient Test 10-Stuck Open PORV 2/Hi Head Injection Inhibited; 06/05/2017
- U2C23 Transient Test 1-Manual Reactor Trip; 06/02/2017
- U2C23 Transient Test 2-Simultaneous Trip of Both Main Feed Pumps; 06/02/2017
- U2C23 Transient Test 4-Simultaneous Trip of All RCPs; 06/02/2017
- U2C23 Transient Test 6-Turbine Trip without Reactor Trip; 06/01/2017
- U2C23 Transient Test 8-Maximum Size RCS Break with Loss of Offsite Power; 06/01/2017

71111.13—Maintenance Risk Assessments and Emergent Work Control

- PMP-4010-CAC-001; Containment Access Control; Revision 19
- PMP-4100-sdr-001; Plant Shutdown Safety and Risk Management; Revision 46
- PMP-4100-SDR-002; Outage Risk Assessment and Management; Revision 11
- AR 2018-0246; DGCD-PS Incorrect Fuses Installed; 01/08/2018
- WO 55511745-01; 1-42-DGCD, Bench Check and Replace Relay
- 12-IHP-5021-IMP-001; Lead Lifting/Landing and Electrical Jumper/Fuse Installation and Removal; Revision 15
- D.C. Cook Unit 2 Technical Requirements Manual Section 8.11.4 and Bases, Accumulators for FLEX Strategies, Revision 74

71111.15—Operability Determinations and Functionality Assessments

- 12MHP5021.032.021; Emergency Diesel Engine Air Start Check Valve Maintenance; Revision 2

- 12-MHP-5021-032-021; Emergency Diesel Engine Air Start Check Valve Maintenance/ Revision 4
- 12-MHP-5021-056-008; Turbine Driven Auxiliary Feed Pump Governor Valve Maintenance; Revision 20
- 680-41400; Containment Sump Strainer Replacement Large Size Head Loss Test Report; Revision 0
- AR 2018-1000; Systpect Starting Air Check Valve Leakage on 1CD 4F; 01/31/2018
- AR 2018-1228; Scattered insulation in containment around/below 2-HV-CEQ-2; 02/08/2018
- AR 2018-1337; Procedural Adherence with CAC-001; 02/09/2018
- Commercial Grad Dedication Evaluation 00011132, Drawing for Air Start Check Valve, Revision 0
- DB-12-AFWS; Auxiliary Feedwater System; Revision 9
- MD-12-SUMP-001-N; Containment Recirculation Sump Function; Revision 1
- OP-1-5120Y-12; Flow Diagram 100# Control Air System Header Diesel Generators 1AB & 1CD Unit #1; 11/30/2015
- OP-1-5151D-72; Flow Diagram Emergency Diesel Generator “CD” Unit No. 1; 11/16/2015
- PRA-MSPI-Basis; MSPI Data – Auxiliary Feedwater Systems; Revision 13
- PRA-NB-QU; Internal Events Quantification Notebook; Revision 4
- PRA-NB-SC; Success Criteria Notebook; Revision 2
- PRA-NB-SY-AFW; Donald C. Cook Nuclear Plant Units 1 and 2 Auxiliary Feedwater System Notebook; Revision 6
- PRA-SDP-2018-01; Risk Analysis of Unit 1 TDAFP Failure to Reach Rated Speed; Revision 0
- UFSAR 14.1.9; Loss of Normal Feedwater Flow; Revision 28
- VTD-DRCO-0011; Terry Turbine (A Division of Dresser Rand) Governor Control System, Revision 0
- VTD-WORT-0001; Worthington Corporation Installation and Operating Instructions for Four Cycle – Diesel and Dual Fuel Engines, Type SWB-VEE; Revision 8

71111.19—Post Maintenance Testing

- 12-IHP-5030-EMP-014; MOV Diagnostics Testing; Revision 22
- 2-OHP-4030-232-027AB; AB Diesel Generator Operability Test; Revision 48
- AR 2018-3247; Air Leak – 2-XRV-221, DG2AB F Bank Start Air Control Valve; 03/22/2018
- AR 2018-3255; 2-OME-150-AB Unloaded Megger Readings Unsatisfactory; 03/22/2018
- DB-12-CTS; Containment Spray system Design Basis Document; Revision 15
- DB-12-EDG; Emergency Diesel Generators Design Basis Document; Revision 10
- DB-12-EDGS; Design Basis Document for the Emergency Diesel Generator Support Systems; Revision 10
- OP-1-98035; Diesel Generator ICD Control Elementary Diagram; 09/11/2014
- OP-2-5120Y-12; Flow Diagram 100# Control Air System Header Diesel Generators 2AB & 2CD Unit #2; 10/27/2015
- OP-2-5151B-68; Flow Diagram Emergency Diesel Generator “AB” Unit No. 2; 12/11/2013
- OP-2-98101-36; Turbine Control Sheet No. 1 Elementary Diagram Unit No. 2 CIA #42373; 10/27/2016
- OP-2-98139-3; Turbine Control Sheet No 1 Elementary Diagram; 12/15/2016
- Operating Logs; Unit 2; 03/22/2018
- PS-2-92059-12; Generator Reat Panel “GRB” Sh. #2 Wiring Diagram; 01/04/2017
- Technical Data Book, Unit 2; 2-Figure 19.8; Revision 49
- VDS-2-WMO-718; AR-2013-10860-19 to Correct Limit Switch Settings, Revision 3
- WO 55420010-01; 2-52X1-RTTB, Replace Relay and Post-Maintenance Test Relay
- WO 55503287-01; 1-DGCD-2301A, Adjust Fuel Limit Start Potentiometer

- WO 55503457; Meggar Cable Associated with 2-QT-106-AB1
- WO 55505562-24; 2-OME-AB; Pre and Post Maintenance Generator Checks
- WO 55509351; 2-WMO-718-ACT; As-Found/Adjust Limit/As-Left Diagnostic
- WO 55509351; Leakby Unit 2 Essential Service Water Outlet valve on the West CTS HX

71111.20—Refueling and Other Outage Activities

- 12-MHP-4050-FHP-023; Reactor Vessel Head Removal with Fuel in the Vessel; Revision 1
- 2-OHP-4021-001-003; Power Reduction; Revision 66
- 2-OHP-4021-001-004; Plant Cooldown from Hot Standby to Cold Shutdown; Revision 72
- 2-OHP-4021-002-005; RCs Draining; Revision 48
- 2-OHP-4021-017-002; Placing in Service the Residual Heat Removal System; Revision 28
- 2-OHP-4030-227-037; Refueling Surveillance; Revision 28
- AEP-94-811; Loop to Loop Power Imbalance; 10/18/1994
- AR 2018-1985; Steel braided tie Downs have Loose Wires on Ends; 02/26/2018
- AR 2018-2012; Unit 2 QPTR Exceeded 1.02 on Downpower; 02/28/2018
- AR 2018-2268; Foreign Material Found in Containment; 03/03/2018
- AR 2018-2321; Teletower Extended While Unattended; 03/04/2018
- AR 2018-2383; Worker in Standard Risk FME Area was not FME Ready; 03/06/2018
- AR 2018-2456; Inadequate FME Controls at Reactor Cavity; 03/06/2018
- AR 2018-2468; MTIS did not Control Tooling in FME High Risk Area; 03/07/2018
- AR 2018-2469; FME Monitors did not Identify Material in an FME Zone; 03/07/2018
- AR 2018-2472; High Risk FME Practices U2 Upper Containment; 03/07/2017
- AR 2018-2676; Install Mechanical Jumper to Reduce Waste Water Generation; 03/10/2018
- AR 2018-2680; Rusting on 2-VFX-4-V2; 03/10/2018
- FO-18-C-072; FME Practices Observed for MTIS Ironworkers for U2C24 Refueling Outage; 03/06/2018
- PM--2010-PRC-003; Procedure and Work Instruction Usage and Adherence; Revision 49
- PMP-2220-0001-0001; Foreign Material Exclusion (FME); Data Sheet 1; Revision 39
- PMP-2220-001-001; Foreign Material Exclusion (FME); Revision 39
- PMP-4100-SDR-001; Plant Shutdown Safety and Risk Management; Revision 46
- R-CW-CIRC-0014; Clearance to Support Dual Train ESW; 03/20/2018
- WO 55495218; FME Zone Requirements

71111.22—Surveillance Testing

- 12-EHP-4030-010-262; Ice Condenser Surveillance and Operability Evaluation; Revision 21
- 12-MHP-4030-010-001; Ice Condenser Basket Weighing Surveillance, Revision 22
- 12-MHP-4030-010-002; Ice Condenser Flow Channel Surveillance; Revision 10
- 1-OHP-4030-132-027CD; CD Diesel Generator Operability Test (Train A); Revision 47
- 2-EHP-4030-234-203; Unit 2 LLRT; Revision 26
- 2-OHP-4030-202-060, PZR Power Operated Relief Valve Testing, 02/28/2018
- 2-OHP-4030-202-060. PZR Power Operated Relief Valve Testing; Revision 19
- 2-OHP-4030-232-217B; DG2AB Load Sequencing & ESF Testing, Revision 52
- 2-OHP-4030-256-017T; Turbine Driven Auxiliary Feedwater System Test; 02/01/2018
- AR 2018- 2158; Administrative Error TDB-2-Fig-19-1; Revision 115; 03/01/2018
- AR 2018-2125. 2-NRV-152 Failed Its IST Closed Stroke Time; 03/01/2018
- AR 2018-2247; DG2AB Field Volt Meter is not Indication Correctly; 03/02/2018
- ECP-12-N1-05, Low Temperature Overpressure Protection, LTOP Setpoint Calculation, Revision 13
- OP-2-5120D-32; Flow Diagram Containment Control Air 85# & 50# Ring Headers Unit 2;

11/18/2016

- Valve Reference Data Sheet, 2-NRV-152, 12/18/2016

71114.06—Drill Evaluation

- 2018 1st Quarter Training Drill Evaluation Report, 03/11/2018
- EP Training Drill Scenario Manual; 02/13/2018
- EP Training Drill Scenario Manual; 02/13/2018
- PMP-2080-EPP-101; Emergency Classification; Revision 21
- PMP-2080-EPP-101; Emergency Classification; Revision 21

71124.01—Radiological Hazard Assessment and Exposure Controls

- 12-THP-6010-RPP-405; Analysis of Airborne Radioactivity; Revision 23
- AR 2017-10435; Security Tour performed Differently due to High Rad; 10/14/2017
- AR 2017-11844; Unanticipated Self Reading Dosimeter Dose Rate Alarm; 11/19/2017
- AR 2017-8976; Unanticipated SRD Dose rate Alarm on the 2/3 Steam Generator Platform; 09/17/2017
- AR 2017-9220; Individual ED Dose Alarm; 09/21/2017
- AR 2018-2336; Poor Radiation Worker Practices used by ICE Personnel; 03/05/2018
- AR 2018-2475; Poor Radiation worker Practices Observed by NOS; dated 03/07/2018
- AR 2018-3474; CESA Box Container of Equipment Fastener Found Loose while Stored Outside of the RPAC; 03/25/2018
- AR 2018-3506; RP did not Verify Neutron Dose Rates for Unit 1 CLV Work Near the Window of the Annulus; dated 03/27/2018
- AR 2018-3626; Potential Industrial Gap in Radiological Contaminated Area Waste Oil Release Methods; 04/02/2018
- Baffle Bolt Tool Radiation Survey Plan 2018
- NSTS; Annual Inventory Reconciliation Report; dated 01/04/2018 and 01/18/2017
- PMP-6010-RPP-001; General Radiation Worker Instructions; Revision 26
- PMP-6010-RPP-003; High, Locked High and Very High Radiation Area Access; Revision 28
- PMP-6010-RPP-006; Radiation Work Permit Program; Revision 25
- PMP-6010-RPP-301; Control of Material in a Radiologically Controlled Area; Revision 32
- PMP-6010-RPP-301; Control of Material in a Radiologically Controlled Area; Liquid/Granular
- RWP 182105; Unit-2 C24 Reactor Baffle Bolt Inspection and Repair Activities to Include Lower Internal Movements; Revision 2
- RWP-171102; U1C28 Reactor Reassembly Activities; Revision 0
- RWP-171105; U1C28 Reactor Baffle Bolt Inspection and Repair Activities to Include Lower Internal Movements; Revision 4
- RWP-171142; U1C28 Containment Install. Modify and Remove Scaffold; Revision 0
- RWP-182105; U2C24 Reactor Baffle Bolt Inspection and Repair Activities to Include Lower Internal Movements; Revision 1
- RWP-182116; U2C24 In-service Test & Inspections in Auxiliary Building and Plant Radiological Controlled Areas; Revision 0
- RWP-182142; U2C24 Containment Install, Modify and Remove Scaffold ; Revision 0
- Solid Release Form and Isotopic Analysis; Release Numbers; 17-0095; 17-0096; 17-0097; 18-0023; 18-1125; 18-0006; 18-0008; 18-0009 through 18-0014
- Unit-1 Report of Core Barrel Moves for LRSS Clevis Bolt Work; Dose Rate Data ED Location Historical Data; 04/30/2013

71124.02—Occupational As Low As Reasonably Achievable Planning and Controls

- 02717473; CREVS Charcoal Test Results did not Meet Acceptance Criteria; 09/16/2018
- ALARA Committee Meeting A-18-22F; Dose Reduction Through Ownership and accountability; 03/19/2018
- DC COOK U1C28 Refueling Outage ALARA Report; 02/05/2018
- PMP-6010-ALA-001; ALARA Program Review of Plant Work Activities; Revision 33

71151—Performance Indicator Verification

- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 7
- Performance Indicator Data on Quarterly Report; 01/01/2017 – 12/31/2017
- PMP-7110-PIP-001; Reactor Oversight Program Performance Indicators and Monthly Operating Report Data; Reactor Coolant Specific Activity; Revision 15

71152—Problem Identification and Resolution

- 1-OHP-4021-003-001; Letdown, Charging and Seal Water Operation, Revision 69
- 1-OHP-4021-003-001; Letdown, Charging and Seal Water Operation, Revision 68
- 1-OHP-4021-003-001; Letdown, Charging and Seal Water Operation; Revision 72
- AR 00090196; While Shifting 75 Gallon per Minute Orifices on Line the Regenerative Heat Exchanger Safety Valve Lifted when 2-QRV-161 was Opened Causing the Reactor Coolant System to Lose Inventory; 04/29/2004
- AR 00090298; The Unit 2 Letdown Safety Valve (2-SV-51) Lifted on 04/29/2004 While Placing a 75 Gallon per Minute Orifice In-service; 04/30/2004
- AR 2017-8716; 1-SV-51 Leakrate of 12.2.Gallons per Minute After Unit 1 Reactor Trip; 09/13/2017
- AR 2018-0634; Unit 1 Letdown Safety Lifted While Removing Letdown Orifice; 01/21/2018
- AR-2017-8740; 1-SV-51, Possible Point of Saturation During Unusual Event; 09/13/2017
- DB-12-CVCS; Chemical and Volume Control System; Revision 8
- GT-00087671; OHP-4021-003-001, Letdown Charging and Seal Water Operation, Attachment 13, Operation of Normal Letdown, does not Provide Adequate Direction for Certain Conditions; 02/17/2004
- OP-1-5129-68; Flow Diagram CVCS-Reactor Letdown & Charging Unit No. 1; 05/06/2017
- UFSAR 14.3; Reactor Coolant System Pipe Rupture (Loss of Coolant Accident); Revision 26
- UFSAR 9.2; Chemical and Volume Control System; Revision 28

71153—Follow-Up of Events and Notices of Enforcement Discretion

- AEP-NRC-2017-32; Cancellation of Licensee Event Report 316/2016-002-00; Emergency Diesel Generators Declared Inoperable Due to a Manufacturing Design Issue; 06/13/2017
- LER 05000316/2016-002-00; Emergency Diesel Generators Declared Inoperable Due to a Manufacturing Design Issue; 02/09/2017
- LER 05000316/2017-001-00; Unit 2 Containment Hydrogen Skimmer Ventilation Fan #1 Inoperable Longer than Allowed by Technical Specifications; Revision 0
- LER 315/2017001-01; Unit 1 Turbine Driven Auxiliary Feedwater Pump Inoperable Longer than Allowed by Technical Specifications; 02/19/2018
- NUREG-1022; Event Report Guidelines 10 CFR 50.72 and 50.73; Revision 3