



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

**REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713**

August 11, 2020

Mr. Brad Berryman
Senior Vice President and Chief Nuclear Officer
Susquehanna Nuclear, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603

**SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 –
INTEGRATED INSPECTION REPORT 05000387/2020002 AND
05000388/2020002**

Dear Mr. Berryman:

On June 30, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Susquehanna Steam Electric Station, Units 1 and 2. On July 30, 2020, the NRC inspectors discussed the results of this inspection with Mr. Kevin Cimorelli and other members of your staff. The results of this inspection are documented in the enclosed report.

One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation documented in this inspection report, 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 I; the Director, Office of Enforcement; and the NRC Resident Inspector at Susquehanna Steam Electric Station, Units 1 and 2.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; and the NRC Resident Inspector at Susquehanna Steam Electric Station, Units 1 and 2.

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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

X /RA/

Signed by: Jonathan E. Greives
Jonathan E. Greives, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 05000387 and 05000388
License Nos. NPF-14 and NPF-22

Enclosure:
As stated

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SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 –
 INTEGRATED INSPECTION REPORT 05000387/2020002 AND
 05000388/2020002 DATED AUGUST 11, 2020

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000387 and 05000388

License Numbers: NPF-14 and NPF-22

Report Numbers: 05000387/2020002 and 05000388/2020002

Enterprise Identifier: I-2020-002-0040

Licensee: Susquehanna Nuclear, LLC

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, PA

Inspection Dates: April 1, 2020 to June 30, 2020

Inspectors: E. Dipaolo, Senior Reactor Inspector
D. Kern, Senior Reactor Inspector
J. Kulp, Senior Reactor Inspector
L. Micewski, Senior Resident Inspector
R. Rolph, Resident Inspector
M. Rossi, Senior Resident Inspector, Acting

Approved By: Jonathan E. Greives, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Susquehanna Steam Electric Station, 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.

List of Findings and Violations

Turbine trip stop and control valve closure scram inoperable during plant start up			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000387/2020002-01 Open/Closed	[H.11] - Challenge the Unknown	71111.22
NRC inspectors identified a Green finding and associated non-cited violation (NCV) of Technical Specification (TS) 5.4.1, "Procedures," when control room operators raised reactor power above 25 percent while the reactor protection system (RPS) scram bypass function was inoperable, as indicated by the turbine control fast closure and stop valve trip bypass alarm being annunciated contrary to procedure GO-100-002, "Plant Startup, Heatup, and Power Operations."			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000388/2020-001-00	LER 2020-001-00 for Susquehanna Steam Electric Station, Unit 2, Manual Reactor Scram Due to Rising Main Condenser Backpressure	71153	Closed

PLANT STATUS

Unit 1 began the inspection period shutdown for a planned refueling outage. Following the completion of refueling and maintenance activities, operators commenced a reactor startup on April 23, 2020. On April 25, 2020, while at 16 percent power, operators returned the unit to Mode 5 following a malfunction of the electrohydraulic control unit system. Operators commenced plant startup operations on April 30, 2020. On May 3, 2020, the unit experienced an automatic scram from 76 percent power due to a failure of a current transformer, which resulted in a main turbine trip. Operators commenced startup operations on May 9, 2020, and reached approximately 77 percent on May 14, 2020, when they reduced power to 57 percent for a rod pattern adjustment. The station achieved 81 percent power on May 16, 2020, when operators lowered power to 57 percent for a rod pattern adjustment, and commenced power ascension on the same day. The unit was at 97 percent on May 20, 2020, when operators lowered power to 58 percent for a rod pattern adjustment, returning to 94 percent power the following day. On June 17, 2020, power was reduced from 100 percent to 57 percent power due to a feedwater heater extraction steam isolation, and the unit was returned to 100 percent power the following day. The station remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 99 percent power. The station had been requested by grid operator on November 21, 2019, to reduce power to approximately 98 percent maximum facility output, during a planned distribution line outage. This request was lifted on June 15, 2020. On April 1, 2020, operators lowered power to 69 percent at the request of the grid operator for planned line work, and returned to full power the following day. On April 15, 2020, operators lowered power to 70 percent for retrieval of a foreign material from the cooling tower basin, and the unit was returned to full power the same day. On May 25, 2020, operators lowered power to 70 percent for water box cleaning, returning the unit to full power the same day. On June 20, 2020, operators lowered power to 63 percent for a rod sequence exchange, returning to full power the same day. On June 21, 2020, operators lowered power to 72 percent to repair a leak on the electrohydraulic control system. While performing this repair, an additional component failure required operators to lower power to 17 percent on June 25, 2020. Operators commenced power ascension the same day. On June 27, 2020, operators lowered power from 84 percent to 64 percent for a rod pattern adjustment, returning the unit to full power the same day. On June 30, 2020, operators lowered power to 83 percent for a rod pattern adjustment and returned to full power the same day.

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.

Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), resident inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time the resident inspectors performed periodic site visits each week and conducted plant status activities as described in IMC 2515, Appendix D; observed risk significant activities; and completed on site portions of IPs. In addition, resident and regional baseline inspections were evaluated to determine if all or portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Seasonal Extreme Weather Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated the summer readiness of the offsite primary and backup alternating current systems and for the unit main condensers on May 11, 2020.

Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the adequacy of the overall preparations to protect risk-significant systems from impending severe weather anticipated strong winds and thunderstorms on April 9, 2020.

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (4 Samples)

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

- (1) Unit 1, division 2 residual heat removal (RHR) and core spray during division 1 outage on April 1, 2020
- (2) Spent fuel pool cooling system on April 15, 2020
- (3) Unit 1, containment instrument gas (CIG) system during 'B' CIG compressor maintenance on June 1, 2020
- (4) Unit Common, 'D' emergency diesel generator (EDG) and 'B' loop emergency service water (ESW) during 'B' EDG repair and testing on June 9, 2020

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated system configurations during a complete walkdown of the Unit 1 'B' loop core spray system on April 15, 2020.

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Unit 1, drywell general area (fire zone 1-4F) on April 1, 2020
- (2) Unit 1, main steam tunnel area (fire zone 1-4G) on April 9, 2020
- (3) Unit 1, spent fuel pool cooling heat exchanger and pump room (fire zone 1-5D) on April 15, 2020
- (4) Unit 1, equipment space elevation 683', (fire zone 1-3C) on April 21, 2020
- (5) Unit 2, control structure upper relay room elevation 754', (fire zone 0-27A) on May 26, 2020

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Unit 2, remote shutdown panel on May 28, 2020

71111.07A - Heat Sink Performance

Annual Review (IP Section 03.01) (1 Sample)

The inspectors evaluated readiness and performance of:

- (1) Residual heat removal service water (RHRSW) heat exchanger 1A inspection on April 22, 2020

71111.08G - Inservice Inspection Activities (BWR)

BWR Inservice Inspection Activities Sample - Nondestructive Examination and Welding Activities (IP Section 03.01) (1 Sample)

- (1) The inspectors verified that the reactor coolant system boundary, reactor vessel internals, risk-significant piping system boundaries, and containment boundary are appropriately monitored for degradation and that repairs and replacements were appropriately fabricated, examined and accepted by reviewing the following activities from April 6, 2020 to April 10, 2020:

03.01.a - Nondestructive Examination and Welding Activities.

1. ASME IWL General Visual (VT3) inspection of Drywell Exterior Concrete Surfaces in Zones 13, 14, 15, 16 (VT-20-014)
2. Radiographic Test on Reactor Water Cleanup Pipe Weld (DBB122-1 FW-4A) (BOP-RT-20-001) in conjunction with EC 2269140 "Install Stainless Steel Piping for DBB122-1 Downstream of FEG332N040"

3. Liquid Penetrant Test on Radiographic Test on Reactor Water Cleanup Pipe Weld (DBB122-1 FW-4A) (BOP-PT-20-22) in conjunction with EC 2269140 "Install Stainless Steel Piping for DBB122-1 Downstream of FEG332N040"
4. Magnetic Particle Examination of Residual Heat Removal Piping Lugs (GBB1151-HW-5A, B, C and D) (MT-20-001, 002, 003 and 004)
5. Ultrasonic Examination of the H4 Core Shroud Weld (CNF-SSES1-2)
6. In-vessel Visual Inspection Enhanced Visual Test (EVT-1) of N2H Jet Pump Riser Welds RS-1A and RS-2 (1-AUG9.1340 and 1-AUG9.1341)
7. Ultrasonic Examination of the A and B Inboard Main Steam Isolation Valve (MSIV) upstream weld VNBB212-FW-A4 and B4 (UT-20-020 and UT-20-005)
8. Replacement of Reactor Water Cleanup System Carbon Steel Piping with Flow Accelerated Corrosion Resistant Stainless Steel Piping (EC 2269140)

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator performance in the Control Room during Unit 1 reactor startup following a refueling outage on April 23, 2020.

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated simulator training on May 18, 2020.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (1 Sample)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) Unit 1, CIG system reliability and corrective actions for CIG header loss of pressure on April 16, 2020 (CR 2020-05868)

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed;

- (1) Unit 2, yellow risk during division 1 ESW pipe replacement on April 3, 2020
- (2) Unit 2, protected equipment during 1B210 outage on April 3, 2020
- (3) Unit 1, yellow shutdown risk during common RHR piping suction maintenance on April 15, 2020
- (4) Unit 2, yellow risk during automatic depressurization system (ADS) level calibrations and testing on April 28, 2020

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (7 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) Unit 1, broken pivot stud on high pressure containment isolation (HPCI) turbine fulcrum bracket spring mount identified on March 31, 2020
- (2) Unit Common, 'A' and 'B' phase breaker stabs misaligned on feeder to motor operated valve for RHRSW/RHR crosstie valve on April 28, 2020
- (3) Unit 1, functionality determination on refueling hoist lowering without command on April 30, 2020
- (4) Unit 1, 125V direct current engineered safeguards system (ESS) distribution panel breaker failed as found short and long time delay testing on May 5, 2020
- (5) Unit 1, RHR pressure relief valve failed as found testing May 12, 2020
- (6) Unit Common, 'E' EDG failed to fully sequence during testing on June 17, 2020
- (7) Unit 1, suppression pool vacuum breaker support not torqued to specification June 29, 2020

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (3 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Engineering Change (EC) 1958923 Unit 1, ESW Loop 'A' supply and return piping replacement, on April 15, 2020
- (2) Design Equivalent Change (DEC) 2247720, Feedwater Check Valve Replacement Graphite Cover Gasket, on April 20, 2020
- (3) Removal of CT-7 from Main Transformer 1X102 on May 4, 2020

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (10 Samples)

The inspectors evaluated the following post maintenance test activities to verify system operability and functionality:

- (1) Unit Common, division 1 ESW buried piping replacement on April 6, 2020
- (2) Unit 1, 1X210 ESS transformer replacement on April 6, 2020
- (3) Unit 1, RHRSW Loop 'A' after scheduled maintenance on April 6, 2020
- (4) Unit 1, 'A' loop RHR after valve work on April 8, 2020
- (5) Unit 1, 'B' loop RHRSW after valve replacement on April 13, 2020
- (6) Unit 1, 'B' loop RHR after valve maintenance on April 13, 2020
- (7) Unit 1, suppression pool vacuum breaker on April 13, 2020
- (8) Unit 1, hydrostatic leak testing following system restoration on April 19, 2020

- (9) Unit 1, electro-hydraulic control system after repairing speed control system on May 1, 2020
- (10) Unit 1, 'B' RHRSW pump after lift setting adjustment on May 13, 2020

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated Unit 1 refueling outage 21 activities from March 23, 2020 to May 14, 2020.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (2 Samples)

- (1) Unit 2, division 2 core spray flow verification on April 17, 2020
- (2) Unit 1, turbine trip bypass logic from start up on May 10, 2020

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) Unit 1, 'A' loop RHR flow surveillance on June 4, 2020

Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

- (1) Unit 1, main steam isolation valve as-found leak rate testing on April 27, 2020

FLEX Testing (IP Section 03.02) (1 Sample)

- (1) Unit 1, hardened containment vent valve local leak rate testing on April 7, 2020

71114.06 - Drill Evaluation

Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated:

- (1) Observation of training evolution and Emergency Action Level (EAL) classification – Anticipated Transient without a Scram (ATWS) and radiological release (simulator training) on May 18, 2020

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Instructions to Workers (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated radiological protection-related instructions to plant workers.

Radiological Hazards Control and Work Coverage (IP Section 03.04) (1 Sample)

The inspectors evaluated in-plant radiological conditions during facility walkdowns and observation of radiological work activities.

- (1) Reactor Water Clean Up Heat Exchanger Room Piping Replacement under radiation work permit (RWP) 20201126. This work involved high dose rates and high contamination controls.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

BI01: Reactor Coolant System (RCS) Specific Activity Sample (IP Section 02.10) (2 Samples)

- (1) Unit 1 (January 1, 2019- December 31, 2019)
- (2) Unit 2 (January 1, 2019- December 31, 2019)

BI02: RCS Leak Rate Sample (IP Section 02.11) (2 Samples)

- (1) Unit 1 (January 1, 2019- December 31, 2019)
- (2) Unit 2 (January 1, 2019- December 31, 2019)

71152 - Problem Identification and Resolution

Semiannual Trend Review (IP Section 02.02) (1 Sample)

- (1) The inspectors reviewed Susquehanna's corrective action program (CAP) for trends that might be indicative of a more significant safety issue.

Annual Follow-up of Selected Issues (IP Section 02.03) (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) Condition Report (CR) CR-2019-03732, Multiple Unit 2 Control Rods Failed to Settle After Reset from Planned Scram on March 23, 2019, due to Control Rod Friction

71153 - Followup of Events and Notices of Enforcement Discretion

Event Followup (IP Section 03.01)

Unplanned plant transient from 100 percent to 64 percent reactor power due to 104C feedwater heater level control valve failure and extraction steam isolation on June 16, 2020

Event Report (IP Section 03.02) (1 Sample)

The inspectors evaluated the following licensee event reports (LERs):

- (1) LER 2020-001-00, Manual scram due to rising condenser back pressure (ADAMS Accession No. ML20098F706). The inspectors determined that the cause of the condition described in the LER was not reasonably within the licensee’s ability to foresee and correct and therefore was not reasonably preventable. No performance deficiency nor violation of NRC requirements was identified.

INSPECTION RESULTS

Turbine trip stop and control valve closure scram inoperable during plant start up			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000387/2020002-01 Open/Closed	[H.11] - Challenge the Unknown	71111.22
<p>NRC inspectors identified a Green finding and associated non-cited violation (NCV) of Technical Specification (TS) 5.4.1, "Procedures," when control room operators raised reactor power above 25 percent while the reactor protection system (RPS) scram bypass function was inoperable, as indicated by the turbine control fast closure and stop valve trip bypass alarm being annunciated contrary to procedure GO-100-002, "Plant Startup, Heatup, and Power Operations."</p> <p><u>Description:</u> The turbine stop valve and control valve closure inputs are two of the reactor scram signals generated by the RPS in the event of a turbine trip at reactor thermal power (RTP) >26%. Turbine stop valve closure inputs to the RPS come from position switches mounted on the four turbine stop valves. Each switch opens before the valve is more than 10% closed to provide the earliest positive indication of closure. Either of the two channels associated with one stop valve can signal valve closure. The logic is arranged so that closure of three or more valves initiates a scram. Turbine control valve fast closure inputs to the RPS come from oil line pressure switches on each of four fast acting control valve hydraulic mechanisms. These hydraulic mechanisms are part of the turbine control and are used to affect fast closure of the turbine control valves. These pressure switches provide signals to the RPS. If hydraulic oil line pressure is lost, a turbine control valve fast closure scram is initiated.</p> <p>Diversity of trip initiation for increases in reactor vessel pressure due to termination of steam flow by turbine stop valve or control valve closure is provided by reactor vessel high pressure trip signals. A closure of the turbine stop valves or control valves at steady state conditions would result in an increase in reactor vessel pressure. If a scram was not initiated from these closures, a scram would occur from high reactor vessel pressure. Reactor vessel high pressure is an independent variable for this condition and provides diverse protective action. The turbine stop valve and control valve closure scram is an anticipatory trip to prevent a rapid power increase resultant from increased reactor pressure.</p> <p>The turbine stop valve closure scram and turbine control valve fast closure scram are automatically bypassed during low power operation. TS Limiting Condition for Operation (LCO) 3.3.1.1 allows the trip to be bypassed during lower power operations to prevent inadvertent scram signals, e.g. plant start up. Closure of these turbine valves below a low</p>			

initial power level does not threaten the integrity of any radioactive material release barrier. Turbine stop valve closure and turbine control valve fast closure trip bypass is affected by four pressure switches associated with the turbine first stage. Any one channel in a bypass state produces a control room annunciation. The switches are arranged so that no single failure can prevent a turbine stop valve closure scram or turbine control valve fast closure scram. In addition, this bypass automatically clears as power is raised above the setpoint for the pressure switches, but per plant TSs this bypass must clear when greater than or equal to 26% of RTP.

Susquehanna's procedure GO-100-002, Revision 113, "Plant Startup, Heatup, and Power Operation," defines actions required at various RTP levels during startup. In the notes to Step 5.74 it is stated that the bypass clears at approximately 22% RTP, and Step 5.77 specifies actions required at or before reaching 25% RTP, including, but not limited to, ensuring that the stop and control valve bypass annunciators have cleared, and to record the power at which this occurs. Alarm Response Procedure AR-103-001, Revision 58, specifies control room operator actions. In section 2, "Operator Actions" for annunciator E03, "Turbine control fast closure and stop valve trip bypass," step 4 specifies that operators "ensure alarm clears prior to 26% RTP."

On May 2, 2020, operators performed GO-100-002, and the bypass signal cleared at 20.8% RTP. This value is consistent with prior start ups, and the approximate target value established by Instrumentation and Control (I&C) procedure IC-158-002, "Calibration of Turbine First Stage Pressure Channels PSH-C72-1N003A, B, C, D, (Turbine Valve Closure Scram and EOC/RPT Bypass)."

On May 9, 2020, while performing procedure GO-100-002, Revision 113, "Plant Startup, Heatup, and Power Operation," operators were in the process of plant start up. The plant was steady for a period of approximately 10 minutes at 24.1% RTP with the turbine stop valve and control valve closure RPS scram still in bypass. Operators noted this condition and decided to proceed with power maneuvers. Operators then withdrew additional control rods and the plant stabilized at 28.5% RTP. During this time, the RPS scram bypass signal did not clear, and control room operators entered LCO 3.3.1.1 for RPS trip capability, and evaluated the applicability of LCO 3.3.4.1, EOC/RPT. It was later determined that LCO 3.3.4.1 did not require entry into action statements since the reactor was operating within the specified limits. The station promptly downpowered to approximately 23%, exiting the condition of applicability, and the station investigated why the scram bypass did not clear. Upon investigation, the station identified that a 1-inch line had severed, resulting in the K9A and K9B relays of the turbine trip logic not sensing sufficient pressure to disable the bypass. The bypass logic uses two divisions (A and B), which are fed by the four relays (A&C for division A, B&D for division B). Under normal conditions, with the bypass disabled, a trip on either channel within a division results in a scram signal from that division. The normal scram logic is either A or C concurrent with either B or D. With both the A and B relays unable to clear the bypass, only one channel in each division was enabled, that is, a scram signal from both C and D would be required to scram the reactor on a stop or control valve closure signal at >26% RTP.

Corrective Actions: The unit was promptly maneuvered to below 26% RTP, repaired the severed steam line, and identified a corrective action to modify the GO-100-002 procedure to preclude recurrence.

Corrective Action References: CR-2020-07186, CR-2020-07187, CR-2020-07351

Performance Assessment:

Performance Deficiency: The failure to implement station procedures on May 9, 2020, was a performance deficiency because it was within Susquehanna's ability to reasonable foresee and correct and should have been prevented.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This determination was informed by IMC 0612, Appendix E, Example 2.f, because the performance deficiency was not administrative in nature and adversely impacted the mitigating systems cornerstone. Specifically, due to operators failing to execute procedural steps as written, power exceeded the allowed value (26% RTP) while the RPS logic function was degraded due to loss of multiple channels on two RPS functions.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." This finding was determined to be Green because it did not affect an RPS trip signal and the function of the redundant or diverse methods of reactor shutdown, it did not involve unintentional positive reactivity changes, and it did not result in mismanagement of reactivity by operators.

Cross-Cutting Aspect: H.11 - Challenge the Unknown: Individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding. Step 5.77 of the GO-100-002 procedure specifies actions required to be completed at less than or equal to 25% RTP. Step 4 of AR-103-001 specifies that operators ensure the turbine trip bypass annunciator clears prior to 26% RTP. On May 9, 2020, operators did note that while stable at 24.1% RTP, the bypass alarm had not cleared. Previous startups indicated this alarm cleared at approximately 21% RTP, including a startup performed on May 2, 2020. Rather than suspend reactivity manipulations and perform an investigation, operators proceeded with withdrawing control rods while expecting the alarm to clear between 24% and 26% RTP. If operators had halted plant maneuvers to investigate and address the cause when not receiving an expected response, the station would not have entered into the condition of applicability with the stop and control valve RPS scram function inoperable.

Enforcement:

Violation: Susquehanna's TS 5.4.1, "Procedures," specifies, in part, that written procedures shall be established, implemented, and maintained as described in Regulatory Guide 1.33, Revision 2, Appendix A, which includes, but is not limited to general plant operating procedures, start-up procedures, and procedures for abnormal, off normal, or alarm conditions.

Susquehanna procedure GO-100-002, Revision 113, "Plant Startup, Heatup, and Power Operation," defines actions required at various RTP levels during startup. Step 5.77 requires that when reactor power is =25%, the licensee shall ensure, in part, that when the turbine control valve fast closure and stop valve trip bypass annunciator clears, the percent of core thermal power is recorded. The stated acceptance criteria is =26%.

Susquehanna procedure AR-103-001, Revision 58, specifies control room operator actions for the turbine control valve fast closure and stop valve trip bypass annunciator alarm.

Step 2.4 specifies that operators shall ensure the alarm clears prior to 26% RTP.

Contrary to the above, on May 9, 2020, Susquehanna failed to implement procedures as described in Regulatory Guide 1.33, Revision 2, Appendix A, pertaining to plant start up and alarm conditions. Specifically, during plant startup, while at 24.1% RTP, the turbine stop valve and control valve closure trip bypass alarm remained annunciated. However, rather than ensuring that the annunciator cleared, the licensee resumed power ascension to 28.5% RTP.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Observation: Multiple Unit 2 Control Rods Failed to Settle After Reset from Planned Scram on March 23, 2019 due to Control Rod Friction

71152

The inspectors performed an in-depth review of Susquehanna's actions following the failure of multiple control rods to settle on Unit 2 after resetting the scram signal following a planned reactor scram on March 23, 2019, in preparation for a refueling outage. The licensee documented the issue in CR-2019-03732. The licensee performed an apparent cause evaluation on the issue which included an extent-of-condition on Unit 1. Similar failures of control rods to settle were experienced on Unit 1 on March 28, 2020, following a planned reactor scram for a refueling outage (CR-2020-04294). The inspectors reviewed the cause analysis, technical evaluations performed, and the corrective actions taken and planned. The inspectors assessed Susquehanna's problem identification threshold, prioritization of the issue, apparent cause analysis, use of operating experience, and timeliness of corrective actions.

The inspectors observed that Susquehanna's apparent cause evaluation for the issue provided a thorough and detailed evaluation of the event. The direct cause for the control rods failing to settle following scram reset was determined to be due to fuel channel deformation causing friction between the fuel channel and the associated control rod. Fuel channel bowing resulting in channel-to-control rod friction is a known phenomenon in boiling water reactors. The evaluation included a detailed technical review of factors that affect fuel channel deformation including comparisons of unit fuel cycles and between Units 1 and 2. The apparent cause was due to Susquehanna's channel management program threshold not properly predicting channel deformation for the fuel cycles. A change in channel supply vendors (Veridiam to Kobe Steel Limited) for some fuel cycles resulted in unpredicted fuel channel bowing magnitude in the channels manufactured by Kobe Steel Limited. The channel manufacturers utilized different manufacturing techniques that apparently resulted in a change in predicted fuel channel bowing.

The inspectors observed that Susquehanna appropriately evaluated the issue, performed a thorough review of operating experience, and performed or planned timely corrective actions. The inspectors verified that Susquehanna implemented corrective actions to resolve control rod friction issues due to Kobe Steel Limited channels during subsequent fuel cycles, to the extent practicable. For Unit 2 Cycle 20, which began operation in the Spring of 2019, the licensee revised the core design to place most of the effected fuel bundles in un-rodged pseudo-cells in the core periphery. Four fuel bundles were loaded in rodged core locations. However, the fuel bundles were orientated to result in channel bowing away from the control rod. For Unit 1 Cycle 22, which began operation in the Spring of 2020, the effected fuel bundles placed in un-rodged pseudo-cells. Susquehanna planned actions to work with the

fuel vendor to better understand Kobe Steel Limited fuel channel bowing rates and to determine further channel management and friction monitoring thresholds.

Observation: Semi-annual trend review

71152

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely related issues documented by Susquehanna in the CAP database, trend reports, site performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed how Susquehanna's CAP evaluated and responded to individual issues identified by the NRC inspectors during routine plant walkdowns and daily CR reviews.

Negative Human Performance Trend

The inspectors noted a marked increase in the number of human performance errors spanning the first two quarters of 2020. Specifically, the station documented 233 CRs with the Human Performance trend code in the first two quarters of 2019 and has documented 430 CRs with the Human Performance trend code in the first two quarters of 2020. While the station did lower its threshold for applying human performance trend codes to CRs, inspectors determined that this likely did not account for the entire increase and that the potential adverse trend warranted monitoring. Susquehanna recognized this adverse trend, specifically procedure use and adherence, as documented in CR-2020-03025. Inspectors noted several examples of the procedural adherence attribute of this issue.

- The inspectors reviewed the circumstances and corrective actions related to component damage caused by use of improper tools, as documented in CR-2020-02590. On February 19, 2020, station personnel identified damage to the 1P105 vacuum pump motor shaft due to the use of a pipe wrench for manual shaft rotation. Upon review of the work instructions REWL S5049, it is clearly stated that this activity is to be completed with a strap wrench. Station corrective actions included a prompt investigation, additional oversight of preventive maintenance activities, and communicating station expectations to operations personnel for performing maintenance activities. The inspectors determined that the damage incurred was the result of a minor performance deficiency for failing to meet the requirements of the work instructions in REWL S5049, which specify the correct tools.
- The inspectors reviewed the circumstances and corrective actions related to component mispositioning, as documented in CR-2020-04283. On March 27, 2020, while performing SM-054-001, plant operators opened the incorrect link for testing. This mispositioned component revealed itself when operators proceeded through the test and the plant response was not as expected. Station corrective actions included a status control investigation and a crew clock reset for the human performance error. The inspectors determined that this mispositioning was a minor performance deficiency for failing to meet the requirements of testing procedure SM-054-001, and a minor violation of 10 CFR Part 50, Appendix B, Criterion V, "Procedures." This violation was determined to be minor because it did not adversely affect the cornerstone objective for mitigating systems, since the error was discovered during the process of testing.
- The inspectors reviewed the circumstances and corrective actions related to foreign material exclusion and control, as documented in CR-2020-05548. On April 12, 2020,

while disconnecting temporary piping sections associated with draining the Unit 1 cooling tower basin for the refueling outage, a section of piping fell into the Unit 2 cooling tower spillway, requiring a downpower to facilitate retrieval. Station corrective actions included revision of the maintenance activity to prevent recurrence. The inspectors determined that this event was a minor performance deficiency for failure to meet maintenance procedure ME-142-001.

- The inspectors reviewed the circumstances and corrective actions related to improper component alignment, as documented in CR-2020-06465. On April 24, 2020, while attempting a plant start up, Unit 1 operators received an electrohydraulic control (EHC) malfunction alarm and subsequent control valve oscillations. Upon further investigation it was discovered that the speed probe in the EHC system was not correctly installed, resulting in a gap in the probe which exceeded allowable tolerances. Station corrective actions included adding independent verification to EHC work instructions and assessed for additional training requirements. The inspectors determined this was a minor performance deficiency for operators failing to correctly install the speed probe according to work instructions because it did not adversely affect the initiating events cornerstone objective.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On July 30, 2020, the inspectors presented the integrated inspection results to Mr. Kevin Cimorelli and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Corrective Action Documents Resulting from Inspection	CR-2020-05349	NRC resident identified safety concern with new baffles stored at CT basin	04/09/2020
71111.04	Corrective Action Documents Resulting from Inspection	CR-2020-05801	NRC identified housekeeping issues	04/15/2020
	Drawings	E106231	SSES Unit 1 Containment Instrument Gas	Revision 27
71111.05	Fire Plans	FP-013-161	Unit 2 Upper Relay Room El. 754	Revision 7
		FP-113-100	Drywell (I-400, I-516, I-607) Fire Zone 1-4F Elev. 704' through 807'	Revision 3
		FP-113-112	Equipment Area (I-202, I-204, I-205) Fire Zones 1-3C-N,S,W, El. 683'	Revision 5
		FP-113-119		Revision 7
71111.07A	Miscellaneous	MT-GM-025, Attachment B	Heat Exchanger Inspection Report	04/01/2020
		MT-GM-031, Attachment B	Heat Exchanger/Immersed Component Coating Inspection Record	04/04/2020
		Report from The Merrick Group Inc.	Eddy Current Inspection Results	04/08/2020
71111.08G	Corrective Action Documents Resulting from Inspection	CR-2020-05450		
71111.12	Corrective Action Documents	CR 2020-05868	Both Containment Instrument Gas Compressors Placed in Service and Unable to Pressurize Header	04/16/2020
		CR 2020-06279	Received BIS AR-250-001 (D01) Containment Instrument Gas System. SV-22643 Open, 150# ADS is Aligned to N2 Bottles	04/22/2020
71111.15	Corrective Action	CR 2017-11564	U1 HPCI injection on Auto Rx Scram due to I&C Jumper	06/08/2017

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Documents		Installation Causing EHC Failure	
		CR 2020-04531	1S211 HPCI Turbine Broken Pivot Stud on Fulcrum Bracket Spring Mount	03/31/20
		CR-2020-04219	E EDG tripped unexpectedly during an operability run	03/26/2020
		CR-2020-04694	EC-1s failed as found testing	04/01/2020
		CR-2020-04704	Unit 1 Refuel Platform hoist motion with no request	04/01/2020
		CR-2020-04808	Refuel Platform hoist lowered without command	04/02/2020
		CR-2020-04895	RHR PSV failed lift test	04/04/2020
		CR-2020-09243	Torque wrench out of tolerance	06/29/2020
	Procedures	AOP-081-001	Fuel Handling Abnormal Operating Procedure	Revision 4
		NDAP-QA-0703	Operability Determinations and Functionality Assessments	Revision 33
		ON-FUEL-001	Fuel Handling System Malfunction	Revision 3
	Work Orders	1829094		
		WO 2330912	Repair broken pivot stud on 1S211 governor control valve linkage	Revision 0
71111.18	Corrective Action Documents	2018-12056	400 dpm Leak from 141F010B, FW LINE B CKV TO RX	08/18/18
		2019-03992	241F010A Feedwater Check Valve Hinge Pin Cover to Valve Body has Larger Than Expected Gap	03/26/19
		AR-2020-07085	Review EC for impact to training materials	05/06/2020
		AR-2020-07086	Review EC2339590 for potential impact to simulator	05/06/2020
		AR-2020-07099	Evaluate restoring computer point to display equivalent winding temperature	05/07/2020
	Engineering Changes	EC 2339590	Commercial Change Package to Remove CT7 from 1X102	
	Miscellaneous		White Paper from Sargent and Lundy Engineering, "Bimetallic Weld Recommendations"	Revision 1
		EC 1958923	Unit 1 ESW Loop A Sply & Rtn Piping Replacement	07/18/2017
	Procedures	IP-ENG-001	Standard Design Process	Revision 1
		MIP 2277	Mechanical Installation Instructions for Engineering Change 1958923	07/18/2017

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		SIP 1210	Site Installation Procedure for Engineering Change 1958923	07/18/2017
	Work Orders	PCWO 1982016		
		PCWO 2258356		
		WO 2202472	141F010B 'B' Feedwater Line Check Valve Soft Seat Inspection & Replacement	04/20/20
71111.19	Corrective Action Documents	CR-2020-05274	Minor leakage from Div 1 RHR	04/08/2020
	Drawings	SE-100-002		Revision 10
	Procedures	SO-100-023	ASME Class I Boundary System Leakage	Revision 7
	Work Orders	PCWO 2333292		
		PCWO 2334133		
		RTSV 1518182		
		RTSV 2317401		
		RTSV 2318764		
		RTSV 2321478		
		RTSV 2329557		
71111.22	Corrective Action Documents	CR-2020-07186	Turbine valve closure bypass locked in above 26% power	05/09/2020
		CR-2020-07351	Enhancement to plant startup procedure	05/13/2020
	Engineering Changes	EC-083-1011	Turbine Valve Closure Scram Bypass Setpoint Calculation	Revision 2
	Procedures	GO-100-002	Plant Startup Procedure	Revision 113
	Work Orders	RTPM 2169047	Turbine trip pressure switch calibration	
		RTSV 2196429		
		RTSV 2332711		
71124.01	Corrective Action Documents	CR-2020-03814	Problem Statement: Anomalies from air sample in RX 2 779 RWCU hold pump room Pertinent Facts: Air sample results had 0.9 DAC. immediate Actions: all work stopped in room, posted room as Air borne radiation area, RPM notified, WCC, Control room. RWP remarks log, and esoms per RP-122	03/16/2020
		CR-2020-04446	Problem Statement: Whole Body Count performed on individual arriving on site for dosimetry indicated the presence of Cs-137.	03/30/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			<p>Pertinent Facts: An individual arrived on site to receive dosimetry and was initially not able to pass the GEM5 portal monitor. Subsequently, a whole body count indicated the presence of natural radon decay progeny/possible Cobalt 60, as well as Cesium 137. A second count with shoes, hoodie, and hat removed indicated very low Cs-137 activity of 3.2 nanocuries. (MDA: 2.77 nanocuries, 5 minute count) The individual was able to pass the GEM5 subsequently. Although the individual was able to pass the GEM5, a final baseline whole body count was performed with the individual wearing only clean scrubs. The count was negative for the presence of any radioisotopes aside from natural Potassium 40, indicating that some contamination was present on the individual's removed clothing. RP individually tested each article of clothing in the small article monitor at Unit 2 and was able to clear all but the individual's pants, which are now confiscated in accordance with NDAP-QA-0627 . Follow up counting of the pants with the gamma spec system was performed, confirming the presence of Co-60 and Cs-137. The individual stated that they did not have any issues passing through portals previous to this at other facilities and that he had not been whole body counted previously. The individual was cooperative throughout the investigation.</p>	
		CR-2020-04814	<p>A worker was observed to put a plastic page protector from a work package into the front hand pocket of their hooded sweatshirt. This was reported to an RP technician who talked to the worker when they were signing out. It was identified that they had placed the work package in their pocket when exiting. The worker was coached on why not to do this and why the package needs to be monitored in a TEM. They did not seem to understand the standard clearly and were receptive to the coaching.</p>	04/02/2020
		CR-2020-05555	<p>Problem Statement: > 50,000 ccpm distributed contamination</p>	04/12/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			<p>on the tip of the nose of a BHI individual working on the feedwater 39A in the wing slab. Pertinent Facts: Individual received feedwater 39A check valve disc and attempted to mechanically remove the pin. Individual adjusted safety glasses while in the area performing work. Immediate Actions: WBC, PCR form, CR, Coaching. Recommendation: Discuss with work group and conduct stand down and/or coaching (group).</p>	
	Corrective Action Documents Resulting from Inspection	AR-2020-05861	<p>Problem Statement: An observation was given by the RP NRC Inspector during the 2020 NRC Inspection 01 - Rad Hazard-Exposure Control that implementing an electronic respirator issuance log could improve the process and program. Pertinent Facts: The current paper log is directly from HP-TP-761 Attachment B, Susquehanna should develop and implement an electronic respirator issuance log to take the place of a paper log for better efficiency and record keeping. Immediate Actions: Discussed this observation with the RP NRC Inspector and documented this AR for tracking.</p>	04/16/2020
		CR-2020-05815	<p>Problem Statement: NRC is conducting an RP baseline inspection. No issues of concern have been identified. Three observations are noted for review: 1) Inspector noted that Form HP-TP-723-1 has a section header labeled "DAC-h," but believed the calc was for DAC rather than DAC-h. 2) Radiological survey review by inspector observes good notations indicating location of air samples and HEPA hoses. 3) Inspector has reviewed RWP entries and corresponding respirator issuance logs and has noted minimal discrepancies where RWP sign-in occurred without a corresponding respirator issuance noted. This can occur if an individual has signed onto a task, but does not end up making an entry necessitating respirator issuance or from an</p>	04/15/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			<p>individual signing onto the wrong task at the kiosk. Inspector observes that implementation of electronic issuance process could improve the process and program.</p> <p>Recommendations</p> <p>1) Form HP-TP-723-1 is used to calculate DAC-h, but the tech basis may need to be reviewed and provided to the inspector to demonstrate the mathematical calculation that has gone into the conversion factors in the formula.</p> <p>2) Communicate observation to department.</p> <p>3) Implement electronic respirator issuance to enhance data storage and retrieval.</p>	
		CR-2020-05863	<p>Pertinent Facts: NRC RP baseline inspector reviewed HP Tech Basis 94-005, "Dose Assessment and Tracking" for applicability of confirmatory vs. required monitoring. While the document specifies individuals are not expected to received in excess of 10% of an annual limit of intake, the inspector observed that the document does not validate the aforementioned assumption.</p> <p>Immediate Actions: Generated CR</p> <p>Recommendation: Revise and update HP Tech Basis 94-005.</p>	04/16/2020
		CR-2020-05864	<p>NRC RP baseline inspector reviewed HP Tech Basis 94-005, "Dose Assessment and Tracking." Inspector's observation is to review the SSES definition of "restricted area" in HP Tech Basis 94-005 to ensure it is not excluding any areas that would qualify as a restricted area as defined in 10 CFR 20. TB 94-005 provides a definition from 10 CFR 20, but also states, "at SSES, this area will be defined as the area within the inner security fence."</p> <p>Actions taken: Generated CR for tracking</p> <p>Recommendation: Review HP Tech basis 94-005 and revise as necessary concurrently with review based on CR-2020-05864.</p>	04/16/2020
	Procedures	HP-TP-223	Internal Dose Investigations and Evaluations	14

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		HP-TP-510	Survey Decontamination and Dose Calculation Techniques for Radioactive Contamination of the Skin or Clothing	24
		HP-TP-720	Airborne Concentration Sampling and Evaluation	44
	Radiation Surveys		Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	03/29/2020 @ 1030
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	03/30/2020 @ 2105
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	03/30/2020 @ 2300
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (Reverse)	03/29/2020 @ 1030
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/01/2020 @ 1650
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/02/2020 @ 1730
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/03/2020 @ 2100
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/03/2020 @ 1230
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/03/2020 @ 2030
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/04/2020 @ 1320
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/04/2020 @ 1000
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/04/2020 @ 2300
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/05/2020 @ 1230
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/06/2020 @ 0900
	Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/09/2020 @ 2100		
		Unit 1 Reactor Building 749' Reactor Water Cleanup Heat	04/10/2020	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Exchanger Room (During Radiography)	@ 2030
			Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (During Radiography)	04/10/2020 @ 2330
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/03/2020 @ 0521
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/03/2020 @ 0030
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room	04/03/2020 @ 2340
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (Cut Out Pipe)	04/02/2020 @1720
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (Cut Pipe)	04/04/2020 @ 1305
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (Weld Pipe)	04/04/2020 @ 1620
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (Cut Pipe)	04/04/2020 @ 1210
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (Prep Pipe)	04/04/2020 @ 2240
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (FAC Pipe Welding)	04/07/2020 @ 2340
			General Area Air Sample - Unit 1 Reactor Building 749' Reactor Water Cleanup Heat Exchanger Room (Welding)	04/08/2020 @ 1130
	Radiation Work Permits (RWP)	20201120	RWCU COMPLEX AND BWRT ROOM: GENERAL WORK, INSPECTIONS & NON-RWCU SYSTEM VALVE BREACHES	0
		20201121	RWCU HOLD PUMP ROOM ACTIVITIES	0
		20201126	FAC PIPING REPLACEMENTS IN RWCU PENT & REGEN HX ROOMS	0
		20201320	SCAFFOLDING WORK IN THE DW	0
		20201351	CRD REBUILD ROOM: CRD EXCHANGE	0
		20201352	UNDERVESSEL PREP WORK: (TO INCLUDE SHOOT OUT	0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			STEEL REMOVAL/REPLACEMENT, UN-COUPLING AND PIP REMOVAL)	
		20201353	CRD EXCHANGE: UNDERVESSEL WORK.	0
		20201360	UNDERSVESSEL WORK-TIE UP NI'S/LPRM CABLE, TEST/STROKE SRM'S & IRM'S/PIPS/TIP TUBING REMOVAL&REPLACEMENT/REPLACE LPRM CABLES/LPRM, SRM, IRM, DRY TUBE REPLACEMENTS & SUPPORT.	0
		20201361	UNDERSVESSEL ACTIVITIES(CABLE WORK, CONNECTORS, ETC.)	0
		20201373	SNUBBER WORK IN DRYWELL	0
71152	Calculations	EC-FUEL-1804	Bases and Recommendations for the Monitoring and Mitigation of Control Cell Friction for Zircaloy-4 Channels	4
	Corrective Action Documents	CR-1176421		
		CR-2019-00612		
		CR-2019-03732		
		CR-2019-12574		
		CR-2020-04294		
	Engineering Evaluations	AR-2019-05552		
		AR-2019-06063		
		NQNFE-B-NA-047	Statistical Analysis of U2C19 Assembly Exposure and Fluence Data for Channel Bow Correlation	0
		PL-NF-15-001	Susquehanna Unit 1 Cycle 20 Reload Risk Assessment	07/02/2015
	Procedures	LS-120	Issue Identification and Screening Process	11
		LS-125	Corrective Action Program	12
		NFP-QA-005	Reload Design and Analysis Process	15
		NR-202	Core Reload Design	21
RE-0TP-203		Core Distortion Testing	1	
TP-055-015		Insert Stall Testing	6	
71153	Procedures	ON-FWHTG-102	Off-Normal FW Heating	Revision 2