



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION I  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PA 19406-2713

January 15, 2019

Mr. Anthony J. Vitale  
Site Vice President  
Entergy Nuclear Operations, Inc.  
Indian Point Energy Center  
450 Broadway, General Services Building  
P.O. Box 249  
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING – DESIGN BASES ASSURANCE  
INSPECTION (TEAMS) REPORT 05000247/2018010 AND 05000286/2018010

Dear Mr. Vitale:

On November 8, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed the onsite portion of an inspection at Indian Point Nuclear Generating, Units 2 and 3. On November 8, 2018, the NRC inspectors discussed the preliminary results of this inspection with you and other members of your staff. After additional review of specific items, the team discussed the final results of this inspection with you and other members of your staff on January 14, 2018. The results of this inspection are documented in the enclosed report.

NRC inspectors did not identify any finding or violation of more than minor significance.

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 the NRC's Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Part 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Mel Gray, Chief  
Engineering Branch 1  
Division of Reactor Safety

Docket Numbers: 50-247 and 50-286  
License Numbers: DPR-26 and DPR-64

Enclosure:  
Inspection Report 05000247/2018010  
and 05000286/2018010

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 INSPECTION (TEAMS) REPORT 05000247/2018010 AND 05000286/2018010  
 DATED JANUARY 15, 2019

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

Docket Numbers: 50-247 and 50-286

License Numbers: DPR-26 and DPR-64

Report Numbers: 05000247/2018010 and 05000286/2018010

Enterprise Identifier: I-2018-010-0036

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Nuclear Generating, Units 2 and 3

Location: Buchanan, NY 10511-0249

Inspection Dates: October 29, 2018 through November 8, 2018

Inspectors: K. Mangan, Senior Reactor Inspector, Division of Reactor Safety (DRS), Team Leader  
S. Pindale, Senior Reactor Inspector, DRS  
J. Brand, Reactor Inspector, DRS  
M. Orr, Reactor Inspector, DRS  
C. Hobbs, Reactor Inspector, DRS  
S. Kobylarz, NRC Electrical Contractor  
C. Baron, NRC Mechanical Contractor

Approved By: Mel Gray, Chief  
Engineering Branch 1  
Division of Reactor Safety

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring Entergy's performance at Indian Point Nuclear Generating, Units 2 and 3 by conducting a design bases assurance inspection 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.

No findings or more-than-minor violations were identified.

## INSPECTION SCOPES

This inspection was conducted using the appropriate portions of the inspection procedure in effect at the beginning of the inspection unless otherwise noted. Currently approved inspection procedures 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 inspection procedure requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter 2515, "Light-Water Reactor Inspection Program - Operations Phase." The team 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

### 71111.21M - Design Bases Assurance Inspection (Teams)

The team evaluated the following components, permanent modifications, and operating experience during the weeks of October 29, 2018, and November 5, 2018.

For the components, the team reviewed the attributes listed in Inspection Procedure 71111.21M, Appendix A, *Component Review Attributes*, such as those listed below. Specifically, the team evaluated these attributes as per 71111.21M, Appendix B, *Component Design Review Considerations* and 71111.21M, Appendix C, *Component Walkdown Considerations*.

#### Components (7 Samples)

- Unit 3 Component Cooling Water Pump (CCP 32)
  - Material condition and installed configuration (e.g., visual inspection/walkdown)
  - Normal, abnormal, and emergency operating procedures
  - Consistency among design and licensing bases and other documents/procedures
  - System health report, maintenance effectiveness and records, and corrective action history
  - Design calculations
  - Surveillance testing and recent test results

The team used Appendix B guidance for *Valves, Instrumentation, Electric Loads, and As-Built System*.

- Unit 2 480 VAC MCC 26A
  - Material condition and installed configuration (e.g., visual inspection/walkdown)
  - Normal, abnormal, and emergency operating procedures
  - Consistency among design and licensing bases and other documents/procedures
  - System health report, maintenance effectiveness and records, and corrective action history
  - Control logic
  - Design calculations

- Surveillance testing and recent test results
- Equipment protection (sealing of cable and conduits)
- Environmental conditions
- Protection coordination; Load in-rush and full load current
- Equipment protection from fire, flood, and water intrusion or spray

The team used Appendix B guidance for *Instrumentation, Circuit Breakers and Fuses, Cables, Electric Loads, and Motor Control Centers (MCCs)*.

- Unit 3 Containment Sump Recirculation Valve SI-MOV-885B

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- System health report, maintenance effectiveness and records, and corrective action history
- Equipment/environmental controls and qualification
- Operator actions
- Design calculations
- Surveillance testing and recent test results
- Equipment protection (sealing of cable and conduits)
- Equipment protection from fire, flood, and water intrusion or spray

The team used Appendix B guidance for *Valves, Instrumentation, Cables, Electric Loads, and As-Built System*.

- Unit 3 125 VDC Bus 31

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- System health report, maintenance effectiveness and records, and corrective action history
- Operator actions
- Design calculations
- Surveillance testing and recent test results
- Environmental conditions
- Contactor and fuse ratings; Component adequacy for minimum voltage
- Equipment protection from fire, flood, and water intrusion or spray
- Ventilation

The team used Appendix B guidance for *Instrumentation, Circuit Breakers and Fuses, Cables, Electric Loads, and As-Built System*.

- Unit 3, Turbine Driven Auxiliary Feedwater Pump 32

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- System health report, maintenance effectiveness and records, and corrective action history

- Design calculations
- Surveillance testing and recent test results

The team used Appendix B guidance for *Valves, Instrumentation, Electric Loads, and As-Built System*.

- Unit 3 Emergency Diesel Generator 31

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- System health report, maintenance effectiveness and records, and corrective action history
- Design calculations
- Surveillance testing and recent test results
- System and component level performance monitoring
- Range, accuracy, and setpoint of installed instrumentation
- Equipment protection from fire, flood, and water intrusion or spray
- Heat removal cooling water and ventilation
- Energy sources, fuel and air (e.g., engine start, operation, and control)

The team used Appendix B guidance for *Valves, Pumps, Instrumentation, Electric Loads, and As-Built System*.

- Unit 2 Emergency RWST to Charging Make-up Valve LCV-112B

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- Corrective maintenance records and corrective action history
- Design basis review at the system and component levels including AOV capability calculations
- Surveillance testing and recent test results

The team used Appendix B guidance for *Valves, Instrumentation, Electric Loads, and As-Built System*.

Component, Large Early Release Frequency (1 Sample)

- Unit 2 Safety Injection Accumulator Tank 23

- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- System health report, maintenance effectiveness and records, and corrective action history
- Operator actions
- Design calculations
- Surveillance testing and recent test results

The team used Appendix B guidance for *Valves, Instrumentation, and As-Built System*.

### Permanent Modifications (6 Samples)

- EC 18294, IP2 Flow Control Valve AFW Minimum Flow Increase
- EC 66581, Essential SW Header Flow Balance to Increase Flow to the FCUs
- EC 63883, Replace Containment Recirculation Fan Motor Cooler 22 Outlet Manual Throttle Valve SWN-71-2C
- EC-059987, IPEC Unit 2, Replace FC-406A, FC-406B, FC-406C, AND FC-406D Yokogawa Controllers with NUS PIDA 700 Series Controllers
- EC 77652, EC to make EC 75844 for the 24 SWP transfer switch disconnect replacement permanent
- EC 69703, Replace Air Regulator on Valve SWN-TCV-1104

### Operating Experience (4 Samples)

- NRC Information Notice 2014-04, Potential for Teflon Material Degradation in Containment Penetrations, Mechanical Seals and Other Components, dated March 26, 2014
- NRC Information Notice 2015-05, Inoperability of Auxiliary and Emergency Feedwater Auto-Start Circuits on Loss of Main Feedwater Pumps, dated May 12, 2015
- NRC Information Notice 2013-18, Refueling Water Storage Tank Degradation, dated September 13, 2013
- NRC Information Notice 2013-06, Corrosion in Fire Protection Piping due to Air and Water Interaction, dated March 25, 2013

## **EXIT MEETINGS AND DEBRIEFS**

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

- On November 8, 2018, the team presented the Design Bases Assurance Inspection (Teams) preliminary results to Mr. Anthony Vitale, Site Vice President, and other members of Entergy staff. The team subsequently discussed the final results of this inspection with Mr. Anthony Vitale, Site Vice President, and other Entergy staff on January 14, 2019.

**DOCUMENTS REVIEWED****71111.21M - Design Bases Assurance Inspection (Teams)**Calculations

1859829-C-002, Seismic Weak Link Thrust Calculation for MOVs SI-MOV-885A/B, Revision 0  
 A14332-C-001, Assessment of A-D Stem/Wedge Pin in Connection with Flowserve Part 21,  
 2/9/15

FEX-00021, 118 VAC Instrument Bus Loading and Voltage Drop Calculation for Instrument  
 Buses 23 & 23A, Revision 2

FEX-00022, 118 VAC Instrument Bus Loading and Voltage Drop Calculation for Instrument  
 Buses 24 & 24A, Revision 2

FEX-00130, IP2 Short Circuit Analysis of the Electrical Distribution System, Revision 0

FEX-00143, IP2 Load Flow Analysis of the Electrical Distribution System, Revision 1

FEX-00204, Station Battery 22 System Calculation, Revision 1

FIX-00004, Motor Driven AFW Pump Flow Loop Accuracy, Revision 2

IP3-CALC-ED-00207, 480V Buses 2A, 3A, 5A & 6A and EDG's 31, 32, and 33 Accident  
 Loading, Revision 8

IP3-CALC-ED-02563, Station Battery Hydrogen Evolution, Revision 4

IP3-CALC-EL-00184, Station Battery 31 System Calculation, Revision 4

IP3-CALC-EL-00186, Station Battery 33 System Calculation, Revision 5

IP3-CALC-SI-01098, Thrust and Torque Limits Calculation for SI-MOV-885B – GL-89-10 MOV  
 Program Thrust, Revision 4

IP3-CALC-STR-03178, Evaluation of Spem Fuel Pool Heat Exchanger in the FSB for Tornado  
 Missiles, Revision 0

IP-CALC-1 2-00089, Indian Point Unit 3 CCW System FATHOM Model Development,  
 Revision 0

IP-CALC-12-00090, Indian Point Unit 3 FATHOM CCW System Thermal Hydraulic Analysis,  
 Revision 0

IP-CALC-16-00017, Control Building Isolation Qualification of Switchgear Room to Turbine  
 Building Doors Under HELB Pressure Loading, Revision 0

IP-CALC-17-00007, End Connection Reduction Effects due to Air Regulator Replacement on  
 SWN-TCV-1104, Revision 0

IP-CALC-18-00002, Environmental Conditions Following a Turbine Building High Energy Line  
 Break (HELB), Revision 0

PAD 77652, Process Activity Determination EC-77652, Revision 0

SGX-00059, Unit 2, Safety Related 480V MCC Coordination Calculation for MCC 26A,  
 Revision 3

Corrective Action Documents

1997-02245	2012-03262	2015-03047	2016-01850
2002-10549	2012-06255	2015-03702	2016-02059
2002-11162	2013-00064	2015-03725	2016-02794
2005-02542	2013-01119	2015-04350	2016-02924
2007-04212	2013-02007	2015-04671	2016-03156
2010-02314	2014-01364	2015-05040	2016-03280
2011-00232	2014-02381	2015-05177	2016-03428
2011-01103	2014-02590	2015-05384	2016-03805
2011-01193	2014-03007	2016-00257	2016-03980
2012-00203	2015-00213	2016-00470	2016-05026
2012-01124	2015-00912	2016-01228	2016-05497

2017-00700	2017-04604	2018-01897	2018-03201*
2017-01151	2017-05114	2018-01930	2018-03213*
2017-01154	2017-05190	2018-02098	2018-03217*
2017-01276	2017-05361	2018-02472	2018-03316*
2017-01808	2017-05549	2018-02507*	2018-03333*
2017-01896	2017-05555	2018-02544	2018-03335*
2017-01933	2017-05748	2018-02933	2018-03378*
2017-01946	2018-00042	2018-02938	2018-03382*
2017-01978	2018-00214	2018-03109	2018-03383*
2017-02023	2018-01366	2018-03169*	2018-03398*
2017-02067	2018-01445	2018-03170*	2018-03402*
2017-02291	2018-01692	2018-03176*	2018-03405*
2017-02784	2018-01814	2018-03177*	2018-05837*
2017-03504	2018-01834	2018-03178*	2018-05893*
2017-04045	2018-01849	2018-03179*	2018-06066*

(\*initiated in response to inspection)

#### Design and Licensing Basis

30052284, NRC Letter – Safety Evaluation, dated 3/10/86  
COR-05-01123, NRC Letter – Supplement to Safety Evaluation, dated 1/30/02  
EC 56002, IP2-CVCS DBD Modification, Revision 2  
Indian Point 2 Updated Final Safety Analysis Report, Revision 26  
Indian Point 3 Updated Final Safety Analysis Report, Revision 7  
Indian Point Unit 2, Improved Technical Specifications, Amendment 288  
Indian Point Unit 3, Improved Technical Specifications, Amendment 264  
IP2-CVCS DBD, Design Basis Document for Chemical Volume and Control System, Revision 2  
IP3-DBD-303, Auxiliary Feedwater System (AFWS), Revision 5  
IP3-DBD-304, Design Basis Document – Service Water System, Revision 5  
IP3-DBD-306, Safety Injection System, Revision 5  
IP3-DBD-324, Emergency Diesel Generators and Appendix R Diesel Generators, Revision 2  
LER 2015-001, Component Cooling and Shutdown Heat Exchanger Lineup Potential to Exceed Design Basis Temperatures, Revision 0  
LER 2015-002-00, Safety System Functional Failure Due to Fuses for Residual Heat Removal Heat Exchanger Outlet Valves That Would Not Remain Operable Under Degraded Voltage Conditions, Revision 0  
Safety Evaluation of Indian Point 3 – Supplement No. 1, dated 1/16/75

#### Drawings

208500, Indian Point Energy Center Unit 2, One Line Diagram 480VAC MCC 26AA, MCC 26BB, & 120VAC Distribution Panels 1 and 2, Revision 48  
250907, Indian Point Energy Center Unit 2, Electrical Distribution and Transmission System, Revision 39  
5008971, Elementary Wiring Diagram Component Cooling Pump 32 Electrical Unit 3, Revision 10  
500B971, Sht. 128, Elementary Wiring Diagram Motor Operated Valves, Revision 8  
504629, ASCO Transfer Switch for Service Water Pump #24 Normal Power Feed, Revision 0  
617F644f, 480V One Line Diagram, Revision 37  
617F645, Main One Line Diagram, Revision 24  
93-13028, 14 Inch Gate Valve with SMB-1 Limitorque Valve Control, Revision D  
9321-F-20173, IP3 Flow Diagram, Main Steam, Revision 72

9321-F-20183, IP3 Flow Diagram, Condensate & Boiler Feed Pump Suction, Revision 65  
 9321-F-2019-119, Indian Point Energy Center Unit 2, Flow Diagram Boiler Feedwater, Revision 119  
 9321-F-20193, IP3 Flow Diagram, Boiler Feedwater, Revision 63  
 9321-F-21193, Flow Diagram Lube Oil to Diesel Generators, Unit 3, Revision 11  
 9321-F-22593, Sht. 2, Diesel Generator Building Fuel Oil and Jacket Water Piping, Revision 10  
 9321-F-23373, Diesel Generator Building Restraint and Support Design, Lines 1038, 1041 and 1044, Revision 4  
 9321-F-27203, Flow Diagram – Auxiliary Coolant System Inside Containment, Revision 26  
 9321-F-27223, Service Water System Nuclear Steam Supply Plant, Revision 52  
 9321-F-2735, Sht. 1, Flow Diagram, Safety Injection System, Revision 145  
 9321-F-27353, Sht. 1, Safety Injection System, Revision 44  
 9321-F-2736, Sht. 1, Flow Diagram, Chemical and Volume Control System, Revision 130  
 9321-F-27503, Sh. 2, Safety Injection System, Revision 59  
 9321-F-27513 Sheet 1, Flow Diagram – Auxiliary Coolant System in PAB & FSB, Revision 34  
 9321-F-27513 Sheet 2, Flow Diagram – Auxiliary Coolant System in PAB & FSB, Revision 45  
 9321-F-3006-98, Indian Point Energy Center Unit 2, Single Line Diagram 480V MCC 26A & 26B, Revision 98  
 9321-F-30083, Indian Point Energy Center Unit 3, Single Line Diagram D.C. System, Revision 63  
 9321-F-3164-25, Wiring Diagram 480V Switchgear 21 Units 17, 18 & 19, Revision DD  
 9321-F-31673, IP3 Wiring Diagram 480V Switchgear Miscellaneous, Revision 28  
 9321-F-33853, Indian Point Energy Center Unit 3, Electrical Distribution and Transmission System, Revision 21  
 9321-F-36033, Indian Point Energy Center Unit 3, One Line Diagram, Appendix “R” Diesel Generator, Revision 15  
 9321-F-7040, Sht. 1, Primary Auxiliary Building Instrumentation Arrangement, Revision 46  
 9321-H-20283, Flow Diagram Jacket Water to Diesel Generators, Unit 3, Revision 26  
 9321-H-20293, Flow Diagram Starting Air to Diesel Generators, Unit 3, Revision 34  
 9321-H-20303, Flow Diagram Fuel Oil to Diesel Generators, Unit 3, Revision 30  
 9321-LL-31173, Schematic Diagram 480V. Switchgear 31 Sht. 14, Revision 13  
 9321-LL-31183, Sht. 5, IP3 Schematic Diagram 480V, Switchgear 32, Revision 23  
 9321-LL-31183, Sht. 5A, IP3 Schematic Diagram 480V, Switchgear 32, Revision 8  
 A202095, Containment Building – Composite Piping at Reactor Coolant Pump No. 34, Revision 20  
 A208088, One Line Diagram of 480 VAC SWGRs 21 & 22 Bus 2A, 3A, 5A & 6A, Revision 47  
 A208377-21, Indian Point Energy Center Unit 2, Main One Line Diagram, Revision 21  
 A208533-09, Indian Point Energy Center Unit 2, Single Line Diagram 125VDC Distribution Panels 21AA, 22AA, 23AA, & 24AA, Revision 9  
 A246986, Indian Point Replacement of Auxiliary Feedwater Valve Trim, Revision 1  
 B225191, Sht. 105, Elementary Wiring Diagram of Control Valve Table, Revision 6  
 B225206, Sht. 121, Elementary Wiring Diagram of Remote Operated Valves, Revision 3  
 D262139, Loop Diagram-CVCS, VCT No. 21 Discharge and RFW Make-Up Valves Loop Number 112, Revision 1  
 IP2-S-000193-13, SWD Control & Indication Service Water Pump 24, Revision DB  
 IP2-S-000255, VCT Drain MOV LCV112C, Revision 3  
 IP3V-0112-0061, IP3 Control Valves for Auxiliary Feedwater System Tag No. FCV-405A, 405B, 405C, 405D, Revision 3  
 IP3V-0112-0120, Model D-100-60 Operator, 2”, 900 PSI, USA Standard Valve Assembly, Revision 2  
 IP3V-13-0002, Breaker Control Schematic, Revision 21

IP3V-13-0003, DC Schematic Breaker Control, Revision 6  
 IP3V-15-0013, Schematic Exciter Voltage Regulator, Revision 4

Functional, Surveillance and Modification Acceptance Testing

0-GNR-404-ELC, Emergency Diesel Generator 2-Year Inspection, performed 3/6/15  
 0-GNR-410-ELC, Emergency Diesel Generator 8-Year Inspection, performed 3/8/15  
 0-MCB-401-ELC, Molded Case Circuit Breaker Inspection / Replacement, performed 3/14/11  
 0-VLV-421-MOV, Motor-Operated Valve Major Preventive Maintenance, performed 3/10/13  
 0-VLV-426-VGB, CONVAL Clampseal Globe Valves, Inspection and Repair, performed 3/30/16  
 0-VLV-442-AOV, Copes Vulcan Air Operated Valve with Screwed in Seats Inspection and Maintenance, performed 1/28/13 and 11/29/15  
 0-VLV-444-REG, Valve Regulator Testing and Replacement, performed 4/4/08  
 12P3J-316, Sht. 1, Conval 2-inch Class 1500 STD Stop Valve, Revision 0  
 2-BRK-012-ELC, Westinghouse Model DB-50 Breaker - Corrective Maintenance, performed 1/13/15 and 3/2/16  
 2-BRK-021-CUB, Westinghouse 480V DB Series Breaker Cubicle Inspection & Cleaning, performed 3/13/12 and 3/25/16  
 2-BRK-023-ELC, DB Breaker Amptector/Westector Overcurrent Test, performed 3/14/12 and 3/1/16  
 2-IC-PC-I-F-406A, Auxillary Boiler Feed Pump No.21 Discharge to Steam Generator No. 21, performed 3/23/18  
 2-IC-PC-I-F-406B, Auxillary Boiler Feed Pump No.21 Discharge to Steam Generator No. 22, performed 4/8/18  
 2-IC-PC-I-F-406C, Auxillary Boiler Feed Pump No.23 Discharge to Steam Generator No. 23, performed 3/23/18  
 2-IC-PC-I-F-406D, Auxillary Boiler Feed Pump No.23 Discharge to Steam Generator No. 24, performed 4/8/18  
 2-MCC-001-ELC, Westinghouse Type W-480 Volt Motor Control Center Preventive Maintenance, performed 12/16/14  
 2-PT-M021A, Emergency Diesel Generator 21 Load Test, performed 8/7/18 and 9/6/18  
 2-PT-R013B, Auxiliary Feedwater Pumps Automatic Actuation Circuits, performed 3/19/18  
 2-VLV-047-VBF, Fisher Series7600 Butterfly Valves and Attached Fisher 656 Actuator, performed 4/4/08 and 3/9/14  
 3-COL-FW-2, Auxiliary Feedwater System, performed 5/7/17  
 3-FAN-010-VSS, Inspection of Emergency Diesel Generator Exhaust Fans, performed 6/12/18  
 3-FAN-014-VSS, Inspection of the Emergency Diesel Generator Intake/Exhaust Fan Louvers/Dampers, performed 1/3/18  
 3-IC-PM-I-E-31BC, 31 Battery Charger Preventive Maintenance, performed 5/5/17  
 3-PT-2Y025, 31, 32, 33 Component Cooling Water Pumps Full Flow Test, performed 2/22/16  
 3PT-CS035, Containment Sump RHR Suction Isolation Valve Functional Test, performed 3/21/17  
 3-PT-Q088, Component Cooling Pumps, performed 11/15/17  
 3-PT-R003C, Safety Injection Test Train 1 and Train 2, performed 5/2/17  
 3-PT-R003D, Safety Injection Test, performed 5/5/17  
 3-PT-R003F, Non-SI Blackout Logic and ABFP Auto-Start Functional Test, performed 4/8/17  
 3-PT-R027, City Water Makeup Supply Valves, performed 4/30/17  
 3-PT-R160A, 31 EDG Capacity Test, performed 3/11/15  
 3-PT-R172A, Station Battery #31 Modified Performance Test, performed 4/30/17  
 EN-MA-125, Troubleshooting Control of Maintenance Activities, performed 4/30/17  
 EN-MA-143, Use of Air Operator Valve Diagnostics, performed 4/4/08 and 3/9/14  
 PFM-118, Battery Charger Testing Using BCT-2000 Computer, performed 5/5/17

PFM-82, BCT-2000 Battery Test Computer Calibration, performed 3/6/17  
 PI-3Y41C, 23 Accumulator Tank In-Service Inspection, performed 10/20/17  
 PT-V24/69, Inservice Valve Tests, performed 3/11/14, 3/31/16 and 3/30/18

#### Miscellaneous

0288-0058-ESA-02, Indian Point Energy Center EDG 3-1 April 2018 Engine Signature Analysis, Revision 0  
 32AFP Vibration Data 9/25/14-9/26/18  
 77652, Design Equivalent Change Package to make EC 75844 for the 24SWP Transfer Switch Disconnect Replacement Permanent, Revision 0  
 CR-IP3-2014-01364, Apparent Cause Evaluation Installed Pressure Regulator Identified to be Potentially Inappropriate for the AFW Pump Room, Revision 1  
 Indian Point Energy Center Maintenance Rule Basis Document, Emergency Diesel Generators (IP-2 and IP-3), Revision 1  
 IPEC Maintenance Rule Basis Document, Residual Heat Removal System, Revision 2  
 IP-RPT-06-AMM04, Aging Management Review of the City Water System, dated 8/27/13  
 IP-RPT-18-00010, Engineering Report Seismic Qualification Report for Square D Disconnect Switch Part No. LK4SU3N, Revision 0  
 NSE-99-050, Evaluation of Apparent Non-conformances Related to CCW Piping Routed Inside Crane Mall, Revision 0  
 P11690, Specification for Service Water System, dated 1/2/92  
 SEP-IP3-IST-1, Inservice Testing Program Basis Document, Revision 2  
 System Health Report, Safety Injection System, Unit 2, Q2-218  
 System Health Report, Safety Injection System, Unit 3, Q2-218  
 System Health Report, Unit 3, DC-DC Power: 1Q, 2Q, 2018  
 System Health Report, Unit 3, DC-DC Power: 3Q, 4Q, 2017  
 WTIPC-2013-64 CA65, OE Evaluation – NRC-IN-2013-18, Refueling Water Storage Tank Degradation, Revision 0

#### Modifications and Design Changes

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 EC 059987, IPEC Unit 2, Replace FC-406A, FC-406B, FC-406C, AND FC-406D Yokogawa Controllers with NUS PIDA 700 Series Controllers, Revision 0  
 EC 18294, IP2 Flow Control Valve AFW Minimum Flow Increase, Revision 0  
 EC 59123, Reply to 2015 NRC CDBI Item 104 - Verify Adequate Operating Voltage to all Unit 2 and Unit 3 Safety Related Equipment, Revision 0  
 EC 63883, Replace Containment Recirculation Fan Motor Cooler 22 Outlet Manual Throttle Valve SWN-71-2C, Revision 0  
 EC 66581, Essential SW Header Flow Balance to Increase Flow to the FCUs (CR-IP3-2015-5766), dated 12/21/16  
 EC 69703, Replace Air Regulator on Valve SWN-TCV-1104

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0-LUB-401-GEN, Lubrication of Plant Equipment, Revision 13  
 0-PMP-411-BFP, Turbine Driven Auxiliary Boiler Feed Pump Overhaul /Inspection, Revision 6  
 0-PMP-422-BFD, Inspection and Repair of Motor Driven Auxiliary Boiler Feed Pumps, Revision 5  
 0-PT-Q001, Alternate Safe Shutdown Equipment Inventory and Inspection, Revision 14  
 0-TUR-403-AFP, Worthington Auxiliary Boiler Feed Pump Turbine Preventive Maintenance, Revision 10

0-VLV-442-AOV, Copes Vulcan Air Operated Valve with Screwed In Seats Inspection and Maintenance, Revision 4  
 2-AOP-480V-1, Loss of Normal Power to Any 480V Bus, Revision 8  
 2-AOP-SSD-1, Control Room Accessibility Safe Shutdown Control, Revision 28  
 2-ARP-SCF, Condensate and Boiler Feed, Revision 50  
 2-ARPSJF, Cooling Water and Air, Revision 43  
 2-ES-1.2, Post LOCA Cooldown and Depressurization, Revision 5  
 2-ES-1.3, Transfer to Cold Leg Recirculation, Revision 9  
 2-PT-Q017E, Alternate Safe Shutdown Supply Verification to 24 SWP, Revision 12  
 2-PT-R036A, Main Transformer #21 Water Deluge System, Revision 9  
 2-PT-R036B, Main Transformer #22 Water Deluge System, Revision 9  
 2-PT-R036C, Unit Auxillary Transformer Water Deluge System, Revision 7  
 2-PT-R036D, Station Auxillary Transformer Water Deluge System, Revision 8  
 2-SOP-10.1.1, Safety Injection Accumulators and RWST Operations, Revision 57  
 2-SOP-11.1, Ventilation System Operation, Revision 63  
 2-SOP-27.1.5, 480 Volt System, Revision 56  
 2-SOP-ESP-001, Local Equipment Operation and Contingency Actions, Revision 15  
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 3-AOP-DC-1, Loss of a 125VDC Panel, Revision 7  
 3-ARP-011, Panel SHF – Electrical, Revision 36  
 3-ARP-019, Panel Local – Diesel Generators, Revision 26  
 3-BKR-018-ELC, Inspection, Lubrication, and Testing of Westinghouse 480V DS532/632 Breakers, Revision 19  
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 3-IC-PC-I-E-31, Diesel Generator No. 31 Electrical Instrumentation, Revision 20  
 3-PT-R040, Transformer Yard Water Deluge System Testing, Revision 23  
 3-SOP-CC-001A, Component Cooling System Operation – Filling, Venting, and Draining, Revision 20  
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 3-SOP-ESP-001, Local Equipment Operation and Contingency Actions, Revision 26  
 3-SOP-V-006, Miscellaneous Heating and Ventilation Systems, Revision 17  
 ARP-13, Hi Room Temp – Control Building El. 15 feet, Revision 31  
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 EN-DC-331, MOV Program, Revision 5  
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 CEP-WP-002, Entergy Nuclear Welding Procedure, Welding Procedure Specification, Revision 0  
 EX-01, Exide Volt Float Charger USF 130-3-150, dated 12/31/79  
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Work Orders

00243455	00461288	52436959	52708866
00244270	00471931	52436960	52708873
00262779	00474124	52437145	52708875
00262780	51224179	52437146	52722206
00344063	51484784	52447175	52760086
00352577	51486578	52504456	52821744
00393667	52189151	52555971	52830515
00416894	52189152	52571416	AR154186
00417194	52213790	52571557	AR154201
00417195	52213870	52595902	AR154211
00417196	52255244	52622993	AR154212
00417403	52308539	52625365	AR154213
00430673	52393071	52672467	AR220070
00446573	52399272	52680208	
00455793	52433469	52690758	
00460006	52435522	52706407	