



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

June 28, 2018

Mr. Joseph W. Shea
Vice President, Nuclear Regulatory Affairs
and Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT – NRC DESIGN BASES ASSURANCE
INSPECTION (TEAM) REPORT 05000259/2018010, 05000260/2018010, AND
05000296/2018010

Dear Mr. Shea:

On May 18, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Browns Ferry Nuclear Plant, Units 1, 2, and 3, and the NRC inspectors discussed the results of this inspection with Mr. D. Hughes and other members of your staff. Additional inspection results were discussed during a teleconference held on June 20, 2018, with Mr. C. Mitchell and other members of your staff. The results of this inspection are documented in the enclosed report.

No NRC-identified or self-revealing findings were identified during this inspection.

However, inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the Browns Ferry Nuclear 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/

Marvin D. Sykes, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos. 50-259, 50-260, 50-296
License Nos. DPR-33, DPR-52, DPR-68

Enclosure:
Inspection Report 05000259/2018010,
05000260/2018010, and 05000296/2018010

cc: Distribution via ListServ

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers: 50-259, 50-260, 50-296

License Numbers: DPR-33, DPR-52, DPR-68

Report Numbers: 05000259/2018010; 05000260/2018010 and 05000296/2018010

Enterprise Identifier: I-2018-010-0052

Licensee: Tennessee Valley Authority (TVA)

Facility: Browns Ferry Nuclear Plant, Units 1, 2, and 3

Location: Athens, AL 35611

Inspection Dates: April 30, 2018, to May 18, 2018

Inspectors: G. Ottenberg, Senior Reactor Inspector (Lead)
C. Franklin, Reactor Inspector
N. Morgan, Reactor Inspector
M. Riley, Reactor Inspector
H. Leake, Contractor
J. Zudans, Contractor

Approved By: M. Sykes, Chief
Engineering Branch 1
Division of Reactor Safety

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring TVA's performance by conducting a Design Bases Assurance Inspection (Team) at Browns Ferry Nuclear Plant, Units 1, 2, and 3, 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. Additional items are summarized in the table below. A licensee-identified non-cited violation is documented in report section 71153.

List of Findings and Violations

No findings were identified.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000296/2017-002-00	4kV Shutdown Board Potential Transformer Primary Fuses Do Not Coordinate with Secondary Fuses	71153	Closed

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedure (IP) 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 reviewed selected procedures and records, observed activities, performed walk downs, 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 (Team)

The inspectors evaluated the following components, permanent modifications, and operating experience during the weeks of April 30 to May 4, 2018, and May 14 to May 18, 2018.

Component (3 Samples)

- (1) Unit 3 "A" and "B" Standby Liquid Control (SLC) Pumps [3-PMP-63-6A, 3PMP-63-6B]
 - a) Material condition and configuration (i.e., visual inspection during a walkdown)
 - b) Normal, abnormal, and emergency operating procedures
 - c) UFSAR, Design Criteria, and other design basis and licensing basis document accuracy
 - d) Environmental qualification classification
 - e) Protection against seismic events
 - f) Component testing adequacy and trending results
 - g) Maintenance effectiveness
 - h) Consistency between station documentation (e.g., procedures, design criteria) and vendor specifications
 - i) Translation of vendor specifications
 - j) System isolation valve condition and monitoring (non-single failure proof)
 - k) Recent major modifications to the system
 - l) Condition reports associated with SLC pumps and system containment isolation valves
 - m) Various hydraulic and net positive suction head calculations associated with this system
 - n) Observation of a pump quarterly inservice test for pump 6A
 - o) Latest system health report
 - p) Review of previously identified potential non-conservative Tech. Spec for this system
- (2) High Pressure Coolant Injection (HPCI) Steam Line Inboard and Outboard Valves [3-FCV-73-002, 1-FCV-73-003]
 - a) Material condition and configuration (i.e., visual inspection during a walkdown)
 - b) Normal, abnormal, and emergency operating procedures
 - c) Environmental qualification classification

- d) Modifications performed (permanent/temporary/minor)
 - e) Methods and inputs for determining actuator output capability, low end of setup window, maximum allowable thrust/torque
 - f) Review of system hydraulic calculations
 - g) Operations monitoring of area temperatures
 - h) Maintenance effectiveness
 - i) Consistency between station documentation (e.g., procedures) and vendor specifications
 - j) Translation of vendor specifications
 - k) Testing and recent test results (Surveillance, IST, GL 96-05 Periodic Verification, Containment Isolation)
 - l) Component health, corrective maintenance records, and corrective action history
- (3) Unit 2 Anticipated Transient Without Scram (ATWS)- Recirculation Pump Trip (RPT) Circuitry
- a) Material condition and configuration (i.e., visual inspection during a walk-down)
 - b) Emergency operating procedures
 - c) Control logic design
 - d) Maintenance effectiveness
 - e) Component health reports, corrective maintenance records, and corrective action history
 - f) Surveillance testing and recent test results
 - g) Electrical calculations

Component- Large Early Release Frequency (LERF) (1 Sample)

- (1) Unit 2, "A" 250 Volt (V) Reactor Motor-Operated Valve (RMOV) Board
- a) Material condition and configuration (i.e., visual inspection during a walkdown)
 - b) Operating procedure
 - c) Maintenance effectiveness
 - d) Component health reports, corrective maintenance records, and corrective action history
 - e) Consistency between station documentation (e.g., procedures) and vendor specifications
 - f) Bus loading and voltage calculations
 - g) Overcurrent protection and coordination
 - h) Protective device selection and settings
 - i) Short circuit capacity
 - j) Surveillance testing

Permanent Modification (4 Samples)

- (1) Reflect Updated Flood Levels for Feedwater and HPCI Steam Line Breaks [DCN-72384]
- (2) Respan of Tech Spec Instruments for EPU [DCNSTG- 68463-05]
- (3) Replace Potential Transformers (PT) Fuses Located Inside 480V Shutdown Board 1A/1B, 2A/2B, 3A/3B [DEC 72449]
- (4) Replace Existing RHRSW Pumps With New Pumps that Have Closed Impellers, Upgraded Materials and a Different Bowl Assembly [DCN- 71313]

Operating Experience (2 Samples)

- (1) NRC Information Notice (IN) 2018-02: Testing and Operations-Induced Degradation of 3-Stage Target Rock Valves
- (2) IN 2016-09, Recent Issues Identified When Using Reverse Engineering Techniques in the Procurement of Safety Related Components

OTHER BASELINE ACTIVITIES

71153 - Follow-up of Events and Notices of Enforcement Discretion

Licensee Event Reports (1 Sample)

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

- (1) Licensee Event Report (LER) 05000296/2017-002-00, 4kV Shutdown Board Potential Transformer Primary Fuses Do Not Coordinate with Secondary Fuses

INSPECTION RESULTS

Licensee Identified Non-Cited Violation	Report Section 71153
This violation of very low safety significance was identified by the licensee and has been entered into the licensee's corrective action program and is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.	
<p>Violation: The Browns Ferry Nuclear Plant, Unit 3, Renewed Facility Operating License, DPR-68, License condition 2.C(7) required, in part, that "TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c)..." Specifically, 10 CFR 50.48(c) incorporated by reference National Fire Protection Association Standard 805 (NFPA 805), and NFPA 805 section 2.4.2.2.2, "Other Required Circuits," required in part, "Other circuits that share common power supply and/or common enclosure with circuits required to achieve nuclear safety performance criteria shall be evaluated for their impact on the ability to achieve nuclear safety performance criteria. (a) Common Power Supply Circuits. Those circuits whose fire induced failure could cause the loss of a power supply required to achieve the nuclear safety performance criteria shall be identified. This situation could occur if the upstream protection device (i.e., breaker or fuse) is not properly coordinated with the downstream protection device."</p> <p>Contrary to the above, since June 22, 2016, when the NFPA 805 requirements went into effect, the licensee did not implement and maintain in effect all provisions of the approved fire protection program, because the licensee did not correctly evaluate circuits that share common power supply for their impact on their ability to achieve nuclear safety performance criteria in accordance with NFPA 805.</p> <p>Significance: The team evaluated the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, Attachment 4, "Initial Characterization of Findings," issued October 7, 2016, for Mitigating Systems, and IMC 0609, Appendix F, "Fire Protection Significance Determination Process," issued May 2, 2018, and determined the finding to be of very low</p>	

safety significance (Green) because the finding was related to post fire safe shutdown- circuit failure modes and affects, was not a low degradation rating, adversely affected the ability to reach and maintain hot shutdown/hot standby or safe and stable conditions using the credited safe shutdown success path, and was evaluated using the licensee's risk-based evaluation, which indicated a Δ CDF of less than 1E-6, and the evaluation result was accepted by an NRC senior reactor analyst.

Corrective Action Reference: CR 1354129

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

- On May 18, 2018, the inspectors presented the design bases assurance (team) inspection results to Mr. D. Hughes, Site Vice President, and other members of the licensee staff.
- On June 20, 2018, additional inspection results were presented to Mr. C. Mitchell and other members of the licensee's staff.

DOCUMENTS REVIEWED

Calculations

0L-084-0002-00-03, 0-L-84-2, Setpoint and Scaling Document, Rev. 3

0L-084-0013-00-05, 0-L-84-13 Setpoint and Scaling Document, Rev. 5

3L-003-0058A-00-03, 3-L-3-58A Setpoint and Scaling Document, Rev. 3

CDQ0009992014000270, Seismic Qualification Analysis for the Sulzer Supplied RHRSW Pumps, Rev. 2

CDQ0009992015000324, Qualification of Seismic Restraints for Replacement RHRSW Pumps, Rev. 3

CD-Q0999-890077, Detuning the BFNP RHRSW-EECW Pumps, Rev. 8

CDQ2433871714, Water Impact Analysis on Torus Shell Due to Feedwater Line Break, Rev. 1

ED-N2003-920049, Setpoint and Scaling Calculation for 2-P-3-204A, -204B, -204C, and -204D, Rev. 7

EDQ0057920034, 4.16KV and 480V Busload, Voltage Drop and Short Circuit Calculation, Rev. 114

EDQ0057920034, 4.16KV and 480V Busload, Voltage Drop and Short Circuit Calculation, Rev. 114

EDQ0211880138, 4kV SD BDs Fuse Calculation/Evaluation, Rev. 38

EDQ024820020042, 250V DC Unit Batt Load Study, VD, SC, and Batt Capacity for LOCA/LOOP, Station Blackout, and NFPA 805 Analysis for Unit/Shutdown, Rev. 79

EDQ0281880139, Fuse Program - 250V DC Reactor RMOV Boards 2A, 2B, & 2C, Rev. 7

EDQ0999870066, Control Circuit Voltage Drop Calc. for Typical Control Relay, Rev. 33

EDQ2000870054, CCVD Calculation - 250V DC Circuits - Unit 2, Rev. 40

EDQ2000870550, Cable and Bus Protection/Breaker/Fuse Coordination for 250V DC Systems, Rev. 48

EDQ2574920145, Degraded Voltage Analysis, Rev. 1

EDQ2999880715, Thermal Overload Heater Calculations - Motor Operated Valves, Rev. 45

EWR No. 16PROJ02325, Clemson Engineering Hydraulics Report 597-16, dated May 2016 has been reviewed by TVA Design Engineering and is approved for Use, Rev. 1

MDQ0000672013000125, Evaluation of EECW Component Flow Rates With the Most Limiting Pump Configuration, Rev. 2
MDQ000999201200083, JOG MOV Periodic Verification Classification, Rev. 23
MDQ002320100019, RHRSW System Hydraulic Analysis for Units 1, 2 & 3 RHR Heat Exchangers, Rev. 5
MDQ0063900083, Standby Liquid Control System Flow Analysis for Requirement, Rev. 8
MDQ0067870245, Emergency Equipment Cooling Water Available NPSH for EECW Dedicated RHRSW Pumps, Rev. 4
MDQ0067930028, EECW System Pressure Drop – Multiflow, Rev. 8
MDQ0999980001, MOV Calculation Input Parameter, Rev. 33
MDQ107320020092, MOV 1-FCV-073-0003, Operator Requirements and Capabilities, Rev. 5
MDQ199920020033, Reactor Building High Energy Line Break Mass and Energy Release for Environmental Analysis, Rev. 1
MDQ3073920407, MOV 3-FCV-073-0002, Operator Requirements and Capabilities, Rev. 8
NDQ0000880019, Flood Level Inside Torus Room, Corner Rooms and HPCI room Due to Feedwater Line Break in the Main Steam Valve Vault, Rev. 6
NDQ0009992016000621, Flood Level Inside the HPCI Room Due to a HPCI Steam Line Break, Rev. 0
NDQ0090930050, Drywell Radiation Monitor Readings Corresponding to LOCA with Various Percentages of Clad Damage (NUMARC EALs), Rev. 11
NDQ0999880020, Flood Levels in the Main Steam Vault and Tunnel Resulting from a Feedwater Line Break, Rev. 6
NDQ09999920076, Flooding in the Reactor Building Due to Breaks in the RWCU System, Rev. 1
NDQ3999910035, Summary of Harsh Environmental Conditions for Browns Ferry Unit 3, Rev. 26

Drawings

0-45B721-1, Fuse Tabulation, Rev. 67
0-45E702, Wiring Diagram Battery Board 2, Panel 1-7 Single Line, Sheet 1, Rev. 65
0-47W462-3, Mechanical Standby Liquid Control System, Rev. 7
1-47A370-73-30, Limit Switch Development and Calve Thrust Requirements: 1-FCV-73-03, Rev. 4
1-47B370-2, Mechanical Motor Operated Valves Testing Requirements, Rev. 8
1-47E225-100, Harsh Environmental Data Drawing Series Index, Notes and References, Rev. 6
1-47E858-1, Flow Diagram RHR Service Water System, Rev. 72
1-47E859-1, Flow Diagram Emergency Equipment Cooling Water, Rev. 98
1-47W1392-217, Fire Protection – 10CFR50.49 Appendix R Penetration Seal Tabular Drawings El. 565.00 Details A & B, Rev. 3
14X20BXVCM 2 Stage, Sulzer RHR Service Water Pump Curve, 12/13/2012
1-730E927, Sheet 10, Elementary Diagram, Primary CNTMT ISLN SYS, Rev. 14
2-45B720, Circuit Breaker Settings, 250V DC Reactor MOV B, Sheet 20, Rev. 3
2-45E670, ECCS Division II Analog Trip Units Schematic Diagram, Sheet 19, Rev. 21
2-45E712, Wiring Diagram, 250V Reactor MOV BD 2A, Sheet 1, Rev. 40
2-45E714, 250V DC Reactor MOV BD 2A Schematic Diagram, Sheet 2, Rev. 31
2-45E714, 250V DC Reactor MOV BD 2A Schematic Diagram, Sheet 3, Rev. 1
2-45E719, Wiring Diagram 4160V Rpt Boards Single Line, Sheet 2, Rev. 12
2-45N2641, Wiring Diagram Unit Control Board Panel 9-3, Sheet 3, Rev. 17
2-45N2641, Wiring Diagram Unit Control Board Panel 9-3, Sheet 3, Rev. 17
2-47E225-113, Harsh Environmental Data El 593.0, Rev. 3
2-730E927, Sheet 10, Elementary Diagram, Primary CNTMT ISLN SYS, Rev. 18

2-730E929, Elementary Diagram, Automatic Blowdown System, Sheet 1, Rev. 24
 2-730E929, Elementary Diagram, Automatic Blowdown System, Sheet 1, Rev. 24
 3-45E670-25, Wiring Diagram ECCS Division I Analog Trip Units Schematic Diagram SH-1, Rev. 11
 3-45E763-12, Wiring Diagram 4160V Unit Aux Power Schematic Diagram, Rev. 7
 3-45E763-20, Wiring Diagram 4160V Unit Aux Power Schematic Diagram, Rev. 6
 3-47A367-73-2, Motor Operated Valve 3-FCV-73-02 Thrust/Torque Requirements, Limit Switch Development & MOV Data, Rev. 1
 3-47E225-125, Harsh Environmental Data EI 593.0, Rev. 8
 3-47E3610-85-2, Mechanical Control Diagram CRD Hydraulic System, Rev. 16
 3-47E610-23-1, Mechanical Control Diagram RHR Service Water System, Rev. 23
 3-47E610-67-3, Mechanical Control Diagram Emergency Equipment Cooling Water System, Rev. 7
 3-47E854-1, Flow Diagram Standby Liquid Control System, Rev. 14
 3-47E858-1, Flow Diagram RHR Service Water System, Rev. 33
 3-47E859-1, Flow Diagram Emergency Equipment Cooling Water, Rev. 42
 3-730E927, Sheet 10, Elementary Diagram, Primary CNTMT ISLN SYS, Rev. 10
 PCS100143776-01, Pump Cross Section, 5/13/2015
 PGA100143776-01, General Arr. And Section Illustration, Rev., RHRSW, 7/31/2014
 Sulzer RHRSW Pump Curve 74338, 12/12/2013

Procedures

0-GOI-200-1, Freeze Protection Inspection, Rev. 87
 0-GOI-300-1/ATT-9, Attachment 9 Unit 3 Reactor Building Operator Round Logs, Rev. 255
 0-GOI-300-3, General Valve Operations, Rev. 142
 0-OI-57D, DC Electrical System, Rev. 167
 0-SI-4.5.C.1(C1), RHRSW Pump C1 IST Group A
 0-SI-4.5.C.1(C1-COMP), RHRSW Pump C1 IST Comprehensive
 0-SIMB-84B, Containment Atmospheric Dilution System Scaling and Setpoint Documents, Rev. 16
 0-TI-230V, Vibration Program, Rev. 18
 0-TI-345(RHRSW), RHRSW Pump Curve Data Acquisition, Rev. 6
 0-TI-346, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting - 10CFR50.65, Rev. 51
 0-TI-360, Containment Leak Rate Programs, Rev. 43
 0-TI-395, Breaker Testing and Maintenance Program, Rev. 12
 0-TI-444, Augmented Inservice Testing Program, Rev. 12
 0-TI-579(SLC), SLC System Baseline Data Evaluation, Rev. 2
 1-ARP-9-7C, Panel 9-7, 1-XA-55-7C, Rev. 27
 1-SR-3.5.1.1(HPCI), Maintenance of Filled HPCI Discharge Piping, Rev. 9
 2-ARP-9-7C, Alarm Response Procedure, Revs. 10 and 25
 2-SR-3.8.6.2(2), Quarterly Check of 250 Volt Main Bank Number 2 Battery, Rev. 18
 3-EOI Appendix-3A, SLC Injection, Rev. 3
 3-OI-63, Standby Liquid Control System, Rev. 24
 3-SI-4.4.A.1, Standby Liquid Control System Functional Test, Rev. 60
 3-SR-3.1.7.7, Standby Liquid Control System Functional Test, Rev. 30
 3-SR-3.3.3.1.4(G), Verification of Remote Position Indicators for High Pressure Coolant Injection System Valves, Rev. 7
 BTI-EEB-TI-28, Setpoint Calculations, Rev. 11
 DS-M18.2.21, Motor Operated Valve Thrust and Torque Calculations, Rev. 24

ECI-0-000-BKR008, Testing and Troubleshooting of Molded Case Circuit Breakers and Motor Starter Overload Relays, Rev. 107
 ECI-0-000-MOV009, Testing of Motor Operated Valves, Rev. 48
 ECI-0-248-BAT001, Equalize Charging the 250 Volt Main Bank Batteries, Rev. 12
 EPI-0-000-BKR003, General Electric Type AK-15/25 Circuit Breakers and Switch Gear Maintenance, Rev. 84
 G-50, Torque and Limit Switch Settings for Motor-Operated Valves, Rev. 9
 IP-ENG-001, Standard Design Process, Rev. 0
 MCI-0-063-ACC001, SLC Accumulator Maintenance, Rev. 18
 NEDP-2, Design Calculation Process Control, Rev. 22
 NEDP-2.1, Electrical Auxiliary Power System Modeling, Rev. 0
 NEDP-2.2, Electrical Power System Analysis Calculations, Rev. 1
 NEDP-8.6, Reverse Engineering Services for Mechanical Items, Rev. 1
 NPG-SPP-01.1, Administration of Standard Programs & Processes, Standard Department Procedures, and Business Practices, Rev. 9
 NPG-SPP-01.2, Administration of Site Technical Procedures, Rev. 17
 NPG-SPP-03.4, Maintenance Rule Performance Indicator Monitor, Trending, and Reporting – 10 CFR 50.65, Rev. 3
 NPG-SPP-06.2, Preventive Maintenance, Rev. 12
 NPG-SPP-06.3, Pre-/Post-Maintenance Testing, Rev. 2
 NPG-SPP-09.0.1, Conduct of Systems Engineering and Equipment Reliability, Rev. 5
 NPG-SPP-09.1, ASME Code and Augmented Programs, Rev. 9
 NPG-SPP-09.16.1, System, Component and Program Health, Rev. 11
 NPG-SPP-09.18.13, Equipment Failure Trending, Rev. 0
 NPG-SPP-09.2, Equipment Environmental Qualification Program, Rev. 10
 NPG-SPP-09.3, Plant Modifications and Engineering Change Control, Revs. 9 and 28
 Pump Test, Rev. 5
 Quarterly Pump Test, Rev. 10

Design Basis Documents

BFN-50-7023, Residual Heat Removal Service Water System, Rev. 28
 BFN-50-7063, Standby Liquid Control Design Criteria Document, Rev. 20
 BFN-50-7067, Emergency Equipment Cooling Water System, Rev. 24
 BFN-50-7068, Reactor Water Recirculation System, Rev. 14
 BFN-50-7073, High Pressure Coolant Injection System, Rev. 31
 BFN-50-7200C, 250 V DC Power Distribution System, Rev. 8
 BFN-50-7200D, 480V AC Auxiliary Power System, Rev. 12
 BFN-50-728, Physical Independence of Electrical Systems, Rev. 25

Plant Modifications

72449, Replace potential transformers (PT) fuses located inside 480V Shutdown Board 1A/1B, 2A/2B, 3A/3B, Rev. A
 72704, Replace potential transformer (PT) fuses in 4kV boards, Rev. 1
 DCN 51198, U1 Recovery Reactor Building Mechanical Lead System 073, Rev. A
 DCN 68463A, Respan of Tech Spec Instruments for EPU, February 8, 2018
 DCN 71802, Create ECP to Install SLC Pump Suction Accumulator, Rev. A
 DCN 71313, Replace Existing RHRSW Pumps With New Pumps that Have Closed Impellers, Upgraded Materials and a Different Bowl Assembly, Rev. A
 DEC 72400, SDP – Standby Liquid Control (SLC) Pump Discharge Accumulator Gauge/Valve Assembly, Rev. A
 EDC 51074, Revise documents to reflect AST requirements see page 2 (attached), Rev. A

EQV 71281, Modify DC MOV's to Improve Valve Stroke Time Margin, Rev. A
SCN 72371, Replace Stem/Stem Nut and Increase Packing Load to Reduce the Potential for Coasting into the Backseat During the Opening Stroke, Rev. A

Miscellaneous Documents

01298689-BFNC0, Accumulator, Typical, QA 1, Hydraulic, Stainless Steel, For HCU, General Electric, CBD755P, Rev. 0
10" – 900 Lb. Double Disc Gate Valve, Rev. 7
150617-CKJ710EG0, Reverse Engineering Documentation Package – Flowserve/BWIP Valve Wedges CWR233F, Rev. 1
2-EOI-1A, ATWS RPV Control Flow Control, May 16, 2018
336655-BFNG, Vendor Documents (ASME Sec. XI, & Drawings) Review and Approval, CRM066A, Clyde Union Pump Co., EWR 11PGM063214 and EWR11MEB063215
BFN0EQ-CSC-001, Conax Corporation – Electric Conductor Seal Assembly, Rev. 22
BFN0EQ-HS-001, Cutler-Hammer – Handswitches, Rev. 16
BFN0EQ-TBK-001, Terminal Blocks, Rev. 25
BFN-50-727, Environmental Qualification, Rev. 6
BFN-VTD-A391-0340, Instruction Manual for Anchor Darling
BFN-VTD-B260-0140, Sulzer Installation Operation and Maintenance Manual
BFN-VTD-F990-0165, Maintenance Manual for Anchor/Darling Double-Disc Gate Valves 2 – ½" And Over, Rev. 4
BFN-VTD-G080-1440, Instructions Installation and Maintenance of 7700 Line Motor Control Center, Rev. 2
BFN-VTD-L200-0010, Vendor Technical Manual for Limitorque Valve Operators, Rev. 21
BFN-VTD-L200-0220, Limitorque Type SMB 10 CFR Part 21 Notifications Maintenance Updates and Technical Updates, Rev. 17
BFN-VTD-L200-0260, Limitorque-SMB Series/SB Installation and Maintenance Manual, Rev. 7
BFN-VTD-U055-0020, Union Pump Co., Instruction Manual for Installation and Operating TD-60 Power Pump Class, Rev. 4
BFN-VTD-V085-0020, Instruction Manual for Operation and Maintenance of Velan Manual Bolted Bonnet Gate, Globe Stop Check and Check Valves, Rev. 4
BFN-VTD-V085-0120, Forged Steel Valves Operation and Installation Manual, Rev. (Valves ¼ - 2")
BFN-VTM-G080-1550, Vendor Technical Manual for General Electric 250-V Reactor MOV Boards, Rev. 13
Browns Ferry Nuclear Plant Motor Operated Valve Trending Report (U3C17), Dated 7/25/2016
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DS-M18.14.1, Design Standard for Environmental Qualification of Electrical Equipment in Harsh Environments, Rev. 4
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Health Report, System 63, Standby Liquid Control, Oct. 16 to March 17
NPG-SPP-03.4, Maintenance Rule Performance Indicator Monitoring, Trending and
POM1001437760010-01, Rev. 0
Reactor Recirculation System 068A/B Second Period System Health Report, 2017
Relay-Control-Electromechanical, Preventative Maintenance Database, April 24, 2018
Reporting - 10CFR50.65, Rev. 3
Reporting - 10CFR50.65, Rev. 51
RHRSW Pumps, Vibration and Flow trends and graphical representations, New Pumps, Various Dates.
SAR Change Package 17-159, October 5, 1998
SAR Change Package 72642-01, November 27, 2017

SCR1147D, 1 PH AC - UPS System 2B, Rev. B
 Standby Liquid Control System, trends and graphical representations, Various dates.
 Switchgear Low Voltage Preventative Maintenance Database, April 23, 2018
 TP16-1-112, Recommendations to Resolve Flowserve 10CFR Part 21 Notification Affection
 Anchor Darling Double Disc Gate Valve Wedge Pin Failures, Rev. 4
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 VTD-G080-1250, General Electric Molded Case Circuit Breakers Application and Selection,
 Rev. 4
 VTD-G080-1300, E 100 Line Molded Case Circuit Breakers Enclosure Compensated, Rev. 1
 VTD-G080-1310, General Electric Molded Case Circuit Breakers F225 Line Ambient
 Compensated Front Adjustable Trip, Rev. 3
 VTD-G080-2825, Application and Selection of General Electric Molded Case Circuit Breakers,
 Rev. 0

Condition Reports

0920418	0946406	1180357	956352	1192007
0922478	1139620	1193742	1143066	1023943
1141448	1142007	1142474	1161842	1183598
1145657	1193771	1237903	CAQR BFP880466	CAQR BFP871034
114949416	1315529	1375227	1269428	1251754
1171957	1167863	1101819	1062524	1251754
1199002	1251656	1354129	1354138	1395412
1283642-005	1334072	1379185	0854255	

Work Orders

09-718856-000	116781658	117483118	95-12472-00	02-003308-000
1147366	0117656136	118795542	119435030	00-003899-000
113740237	116781673	117651692	119415324	119343263
116781647	117479103	114693925-T	06-713118-000	117845209
117557873	118020640	118065081	118308521	
117845209	95-012472	09-718856	11469392	
118435926	118435929	09-725975-000	115752639	

Condition Reports Written Due to this Inspection

CR 1410526, [NRC Identified] - Unsecured Cart U3 RB El. 565' near East Bank HCUs
 CR 1410844, NRC identified concern with tarps on RHRSW roof grating
 CR 1410846, NRC identified concern with housekeeping in the D RHRSW Pump Room
 CR 1410988, 2A RMOV BD DBAI walkdown action
 CR 1411570, Documentation issue discovered during the 2018 DBAI.
 CR 1413186, Calculation EDQ0211880138 R36 - DBAI Inspection
 CR 1413537, DBAI Inspection - Bend Radius Issue for Battery Room 2
 CR 1414957, EQ devices in containment not previously evaluated for chemical effects
 CR 1414959, Evaluate raising SLC injection radiation monitor criteria such that a LOCA does
 not result in SLC
 CR 1415132, DBAI Walkdown additional information
 CR 1415217, (DBAI): Battery Charger Short Circuit contribution not included Calculation
 EDQ024820020042

CR 1415861, (DBAI): Vendor (General Electric) Molded Case Circuit Breaker Interrupting Ratings
CR 1415887, 2018 DBAI URI: 250V DC RMOV Board
CR 1419666, MAXIMO doesn't match calculation for EQ device