



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD
ARLINGTON TX 76011-4511

September 22, 2016

Mr. Shane M. Marik, Site Vice President
and Chief Nuclear Officer
Omaha Public Power District
Fort Calhoun Station
Mail Stop FC-2-4
9610 Power Lane
Blair, NE 68008

SUBJECT: FORT CALHOUN STATION – NRC EVALUATIONS OF CHANGES, TESTS,
AND EXPERIMENTS AND PERMANENT PLANT MODIFICATIONS BASELINE
INSPECTION REPORT 05000285/2016008

Dear Mr. Marik:

On August 11, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Fort Calhoun Station. The NRC inspectors discussed the results of this inspection with Mr. S. Fatora, Acting Plant Manager, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding of very low significance (Green) in this report. The finding involved a violation of NRC requirements that was determined to be a Severity Level IV violation under the traditional enforcement process. The NRC is treating this violation as non-cited (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the non-cited violation (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, IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at Fort Calhoun Station.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS)

S. Marik

- 2 -

component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Thomas R. Farnholtz, Chief
Engineering Branch 1
Division of Reactor Safety

Docket No. 50-285
License No. DPR-40

Enclosure:
Inspection Report 05000285/2016008
w/Attachment: Supplemental Information

cc w/ encl: Electronic Distribution

S. Marik

- 2 -

component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Thomas R. Farnholtz, Chief
Engineering Branch 1
Division of Reactor Safety

Docket No. 50-285
License No. DPR-40

Enclosure:
Inspection Report 05000285/2016008
w/Attachment: Supplemental Information

cc w/ encl: Electronic Distribution

Distribution:
See next page

ADAMS ACCESSION NUMBER: ML16266A494

<input checked="" type="checkbox"/> SUNSI Review By: RLatta		ADAMS <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		Keyword: NRC-002
OFFICE	SRI:EB1	RI:EB1	SRI:EB2	C:EB1	C:PBD	C:EB1		
NAME	RLatta	JBraisted	SGraves	TFarnholtz	GMiller	TFarnholtz		
SIGNATURE	/RA/	E-mail	/RA/	/RA/ WSifre for	/RA/	/RA/		
DATE	9/14/16	9/14/16	9/13/16	9/15/16	9/14/16	9/22/16		

OFFICIAL RECORD COPY

Letter to Shane M. Marik from Thomas R. Farnholtz, dated September 22, 2016

SUBJECT: FORT CALHOUN STATION – NRC EVALUATIONS OF CHANGES, TESTS,
AND EXPERIMENTS AND PERMANENT PLANT MODIFICATIONS BASELINE
INSPECTION REPORT 05000285/2016008 AND NOTICE OF VIOLATION

Electronic distribution by RIV:

Regional Administrator (Kriss.Kennedy@nrc.gov)
Deputy Regional Administrator (Scott.Morris@nrc.gov)
DRP Director (Troy.Pruett@nrc.gov)
DRP Deputy Director (Ryan.Lantz@nrc.gov)
DRS Director (Anton.Vegel@nrc.gov)
DRS Deputy Director (Jeff.Clark@nrc.gov)
Senior Resident Inspector (Max.Schneider@nrc.gov)
Acting Resident Inspector (Lindsay.Brandt@nrc.gov)
Branch Chief, DRP/D (Geoffrey.Miller@nrc.gov)
Project Engineer, DRP/D (Brian.Parks@nrc.gov)
Project Engineer, DRP/D (Jan.Tice@nrc.gov)
RIV Public Affairs Officer (Victor.Dricks@nrc.gov)
Project Manager (Fred.Lyon@nrc.gov)
Team Leader, DRS/IPAT (Thomas.Hipschman@nrc.gov)
Project Engineer, DRS/IPAT (Eduardo.Uribe@nrc.gov)
RIV RITS Coordinator (Marisa.Herrera@nrc.gov)
RIV Regional Counsel (Karla.Fuller@nrc.gov)
Congressional Affairs Officer (Jenny.Weil@nrc.gov)
RIV Congressional Affairs Officer (Angel.Moreno@nrc.gov)
Technical Support Assistant (Loretta.Williams@nrc.gov)
RIV/ETA: OEDO (Jeremy.Bowen@nrc.gov)
RIV RSLO (Bill.Maier@nrc.gov)
ACES (R4Enforcement.Resource@nrc.gov)

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket(s): 05000285
License(s): DPR-40
Report(s): 05000285/2016008
Licensee: Omaha Public Power District
Facility: Fort Calhoun Station
Location: 9610 Power Lane
Blair, NE 68008
Dates: July 25 to August 11, 2016
Inspectors: R. Latta, Senior Reactor Inspector, Lead
S. Graves, Senior Reactor Inspector
J. Braisted, Reactor Inspector
Approved By: Thomas R. Farnholtz
Chief, Engineering Branch 1
Division of Reactor Safety

Enclosure

SUMMARY

IR 05000285/2016008; 07/25/2016 – 08/11/2016; Fort Calhoun Station; Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications.

This report covers a two-week announced baseline inspection on evaluations of changes, tests, and experiments and permanent plant modifications. The inspection was conducted by Region IV based engineering inspectors. One finding was identified by the inspectors. The finding was considered a non-cited violation (NCV) of NRC regulations. The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Cross-cutting aspects were determined using Inspection Manual Chapter 0310, "Aspects Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6, dated August 2016.

A. NRC-Identified Findings and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Severity Level IV/Green. The inspectors identified a Severity Level IV, Green, non-cited violation of 10 CFR 50.59, "Changes, Tests, and Experiments," Section (c)(1), which states, in part, that a licensee may make changes in the facility as described in the final safety analysis report (as updated) without obtaining a license amendment pursuant to 10 CFR 50.90 only if: (i) a change to the technical specifications incorporated in the license is not required, and (ii) the change, test, or experiment does not meet any of the criteria in paragraph (c)(2). Title 10 CFR 50.59, Section (c)(2), states, in part, that a licensee shall obtain a license amendment pursuant to Section 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the final safety analysis report (as updated). Specifically, from June 9, 2015 through August 11, 2016, the licensee implemented a change to Operating Instruction OI-VA-2, "Auxiliary Building Ventilation System Normal Operation," Attachment 11, Revision 47, after incorrectly concluding that the opening of certain high-energy line break barriers and selected fire barrier doors to allow supplemental cooling of both safety-related switchgear rooms did not increase the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the final safety analysis report. In response to this issue, the licensee revised entry conditions to Operating Instruction OI-VA-2, Attachment II, to ensure that high energy line break barriers are not impaired prematurely. This finding was entered into the licensee's corrective action program as Condition Report CR-2016-06667.

The licensee's failure to implement the requirements of 10 CFR 50.59 and adequately evaluate the disabling of certain high-energy line break barriers to facilitate supplemental cooling of both safety-related switchgear rooms was a performance deficiency. This finding was evaluated using traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. In accordance with Section 2.1.3.E.6 of the NRC Enforcement Manual, the inspectors used Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process For Findings At-Power," dated June 19, 2012, to determine that this performance deficiency was of very low safety significance (Green) because it (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than its technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety significance in accordance with the licensee's maintenance rule program. Therefore, in accordance with Section 6.1.d.2 of the NRC Enforcement Policy, the inspectors characterized this performance deficiency as a Severity Level IV violation. As described in Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," no cross-cutting aspect was assigned to this violation because traditional enforcement violations are not assessed for cross-cutting aspects. (Section 1R17.1.b)

REPORT DETAILS

1. REACTOR SAFETY

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

1R17 Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications (71111.17T)

.1 Evaluations of Changes, Tests, and Experiments

a. Inspection Scope

The inspectors reviewed 10 evaluations performed pursuant to Title 10, *Code of Federal Regulations* (CFR), Part 50, Section 59, to determine whether the evaluations were adequate and that prior NRC approval was obtained as appropriate. The inspectors also reviewed 21 screenings, where licensee personnel had determined that a 10 CFR 50.59 evaluation was not necessary. The inspectors reviewed these documents to determine if:

- the changes, tests, and experiments performed were evaluated in accordance with 10 CFR 50.59 and that sufficient documentation existed to confirm that a license amendment was not required;
- the safety issue requiring the change, tests and experiment was resolved;
- the licensee conclusions for evaluations of changes, tests, and experiments were correct and consistent with 10 CFR 50.59; and
- the design and licensing basis documentation was updated to reflect the change.

The inspectors used, in part, Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, to determine acceptability of the completed evaluations and screenings. The NEI document was endorsed by the NRC in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," dated November 2000. The list of evaluations, screenings, and/or applicability determinations reviewed by the inspectors is included as an Attachment to this report.

This inspection constituted 10 samples of evaluations and 21 samples of screenings and/or applicability determinations as defined in Inspection Procedure 71111.17-04.

b. Findings

Failure to Obtain Prior NRC Approval for a Change When Required

Introduction. The inspectors identified a Severity Level IV, Green non-cited violation of 10 CFR 50.59, "Changes, Test, and Experiments," associated with the licensee's failure to adequately evaluate a change in order to ensure that they did not require prior NRC review and approval.

Description. During review of 10 CFR 50.59 Evaluation 15-110, Revision 0, associated with Engineering Change (EC) 65749, "Update Procedure, Calc, for Switchgear Supplemental Cooling," Revision 0, the inspectors noted that the licensee had changed Operating Instruction OI-VA-2, "Auxiliary Building Ventilation System Normal Operation," Attachment 11, Revision 47, to allow the opening of certain high-energy line break barriers and selected fire barrier doors to provide supplemental cooling to both safety-related switchgear rooms. As documented in EC 65749, Revision 0, the switchgear rooms contain the electrical system normal and safety-related components (e.g., 4160V buses, 480V buses, inverters, and breakers that feed power to normal power production equipment and all safety-related equipment required by Technical Specifications). The inspectors also noted that the associated 10 CFR 50.59 review concluded that NRC prior approval was not required based on the evaluation of the proposed changes to Station Procedure OI-VA-2 against the eight 10 CFR 50.59 evaluation form questions. Specifically, the licensee had answered question .2 ("Does the proposed activity result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the USAR?") in the negative, despite the introduction of a new failure mode for the affected safety-related switchgear components to be damaged as a result of a postulated high-energy line break. The new failure mode would damage both trains of safety-related switchgear, which would reduce electrical redundancy to mitigate the effects of a postulated high-energy line break.

The inspectors determined that the licensee's conclusion was incorrect, in that, this change resulted in a more than minimal increase in the likelihood of the occurrence of a malfunction of a structure, system, or component important to safety that had been previously evaluated. The inspectors informed the licensee of their concerns, and the licensee initiated Condition Report CR-2016-06667 to document this issue in the station's corrective action program.

Analysis. The licensee's failure to implement the requirements of 10 CFR 50.59 and adequately evaluate the disabling of certain high-energy line break barriers to facilitate supplemental cooling of both safety-related switchgear rooms was a performance deficiency. This finding was evaluated using traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. In accordance with Section 2.1.3.E.6 of the NRC Enforcement Manual, the inspectors used Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process For Findings At-Power," dated June 19, 2012, to determine that this performance deficiency was of very low safety significance (Green) because it

(1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than its technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety significance in accordance with the licensee's maintenance rule program. Therefore, in accordance with Section 6.1.d.2 of the NRC Enforcement Policy, the inspectors characterized this performance deficiency as a Severity Level IV violation. As described in Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," no cross-cutting aspect was assigned to this violation because traditional enforcement violations are not assessed for cross-cutting aspects.

Enforcement. The inspectors identified a Severity Level IV, Green, non-cited violation of 10 CFR 50.59, "Changes, Tests, and Experiments," Section (c)(1), which states, in part, that a licensee may make changes in the facility as described in the final safety analysis report (as updated) without obtaining a license amendment pursuant to 10 CFR 50.90 only if: (i) a change to the technical specifications incorporated in the license is not required, and (ii) the change, test, or experiment does not meet any of the criteria in paragraph (c)(2). Title 10 CFR 50.59, Section (c)(2), states, in part, that a licensee shall obtain a license amendment pursuant to Section 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the final safety analysis report (as updated). Contrary to the above, from June 9, 2015 through August 11, 2016, the licensee failed to obtain a license amendment pursuant to Section 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the final safety analysis report (as updated). Specifically, the licensee implemented a change to Operating Instruction OI-VA-2, "Auxiliary Building Ventilation System Normal Operation," Attachment 11, Revision 47, after incorrectly concluding that the opening of certain high-energy line break barriers and selected fire barrier doors to allow supplemental cooling of both safety-related switchgear rooms did not increase the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the final safety analysis report. In response to this issue, the licensee revised entry conditions to Operating Instruction OI-VA-2, Attachment II, to ensure that high energy line break barriers are not impaired prematurely. This finding was entered into the licensee's corrective action program as Condition Report CR-2016-06667. Because this violation was entered into the corrective action program to ensure compliance was restored in a reasonable amount of time, and the violation was not repetitive or willful, this Severity Level IV violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000285/2016008-01, "Failure to Obtain Prior NRC Approval for a Change When Required."

.2 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed 12 permanent plant modifications that had been installed in the plant during the last three years. This review included in-plant walkdowns for portions of the affected systems. The modifications were selected based upon risk significance, safety significance, and complexity. The inspectors reviewed the modifications selected to determine if:

- the supporting design and licensing basis documentation was updated;
- the changes were in accordance with the specified design requirements;
- the procedures and training plans affected by the modification have been adequately updated;
- the test documentation as required by the applicable test programs has been updated; and
- post-modification testing adequately verified system operability and/or functionality.

The inspectors also used applicable industry standards to evaluate acceptability of the modifications. The list of modifications and other documents reviewed by the inspectors is included as an Attachment to this report.

This inspection constituted 12 permanent plant modification samples as defined in Inspection Procedure 71111.17-04.

.2.1 Equipment Environmental Qualification Fuse Isolation for HCV-1041A/1042A

The inspectors reviewed Engineering Change 54244, implemented to correct main steam isolation valve component environmental qualification issues. The change installed additional fuses and fuse blocks in the control circuits for valves HCV-1041A and HCV-1042A to provide the necessary isolation between the existing non-environmentally qualified components installed in the harsh environment and the environmentally qualified components that provided required position indication for the main steam isolation valves in the control room. The change also installed an additional indicator light on the main steam isolation valves control switch assembly to indicate the availability of control power to the circuit. The non-environmentally qualified components were associated with the test function and the slow-open function of the isolation valves, neither of which were safety-related functions. The deficiency was identified by the licensee during a review of the plant's environmental qualification program. The inspectors did not identify any significant concerns with the engineering change package.

.2.2 Diesel Generator Engine Controls Upgrade

The inspectors reviewed Engineering Change 41956, implemented as a result of an analysis performed by the licensee to identify reasons for repetitive component failures associated with emergency diesel generator system voltage regulator and control circuits and component obsolescence issues. This change was associated with the control circuits only. This change replaced existing problematic electrical relays with relays having higher inductive load break ratings and higher contact ratings, added surge suppression diodes and Zener diodes in parallel with the new relay coils for component protection, installed improved pushbutton switches, replaced existing speed-sensing components with more reliable and efficient solid state devices, and replaced existing power line filters with DC-DC converters. The inspectors did not identify any significant concerns with the engineering change package.

.2.3 Replacement of Conax Electrical Conductor Seal Assembly and Pigtails on Namco Limit Switches Below the Post Design Basis Accident Submergence Level in Containment

The inspectors reviewed Engineering Change 58770, implemented in response to the licensee's determination that 10 safety-related valve position limit switches, located inside containment, had Conax electrical conductor seal assemblies with Kapton insulated conductors that did not meet the licensee's environmental qualification program requirements for possible submergence below containment flood levels. The limit switches on each valve provided open or closed position indications in the control room and other locations. In response to this condition, the Conax conductor seal assemblies with Kapton insulated pigtails connecting the limit switches to junction boxes, along with the associated flexible conduits, were either relocated or replaced with items that were qualified for the harsh environment and submergence durations defined in plant calculations. The inspectors did not identify any significant concerns with the engineering change package.

.2.4 Component Cooling Water Pump Motor Cable and Conduit Upgrade

The inspectors reviewed Engineering Change 55358, which was implemented after the licensee identified insulation and jacket degradation on power cables for the respective component cooling water pump motors AC-3A-M, AC-3B-M, and AC-3C-M at the motor terminal boxes. The jacketing problems were attributed to an incorrect cable-bending radius during previous installation. The change removed the existing cabling from the motor connection terminal boxes out to the cable trays, installed new cabling having a slightly smaller cross-sectional area into conduit to facilitate better in-line connection geometry, installed new junction boxes to house the replacement cable connections, and improved the motor terminal connections. After required derating factors were applied, the new cable assemblies had a higher ampacity rating, resulting in improved margin. The inspectors did not identify any significant concerns with the engineering change package.

.2.5 TR-408 Spent Fuel Pool Temperature Recorder

The inspectors reviewed Facility Change 38103, in part, to establish a comparison between different plant change processes and methods of implementation. Specifically, this facility change was implemented to integrate spent fuel pool temperature monitoring into the plant distributed control system and the emergency response facility computer system following the failure of the original TR-408 recorder. The licensee temporarily replaced the failed recorder with a digital recorder and subsequently performed this change to connect the spent fuel temperature detector assemblies to a data acquisition system, which provided inputs to the distributed control system and emergency response facility computer system. The new system also provides input to the plant data historian system and additional user-defined setpoints that were configured to provide additional temperature data to the control room operators. The inspectors did not identify any significant concerns with the facility change package.

.2.6 Raw Water Strainer Upgrade

The inspectors reviewed Engineering Change 41587, implemented to address the safety-related classification of the raw water pump discharge strainer internals. As originally designed, the strainer casings were the only safety-related components based on the pressure boundary function associated with passing sufficient flow to meet design basis cooling requirements. The internal, rotating basket, associated drive mechanism, and backwash function were not classified as safety-related. However, as subsequently determined by the licensee, a loss of function of the strainer internals could have compromised the credited raw water flow rate under accident conditions or compromised safety-related components downstream due to debris in the system from a failure of the strainer internals. In response to this condition, this engineering change was developed to address the concerns regarding the current nonsafety classification of the strainer internals. Specifically, the inspectors reviewed the engineering change package, vendor manuals, system drawings, alarm response procedures, surveillance tests, preventive maintenance tasks, work orders, corrective action documents, and performed a system walkdown. The inspectors did not identify any significant concerns with the engineering change package.

.2.7 Modify Piping and Supports for FW-10 Main Steam Supply in Response to High-Energy Line Break Concerns

The inspectors reviewed Engineering Change 53202, implemented to address a non-conforming condition associated with overstressed steam supply piping to the turbine-driven auxiliary feedwater pump FW-10. The licensee's high-energy line break analysis reconstitution project identified that portions of the steam supply piping to pump FW-10 were overstressed when the main steam system was aligned to the pump. The purpose of this engineering change was to implement the required modifications to the piping and piping supports identified in the analysis to eliminate code check overstresses and high-energy line breaks and cracks. Specifically, the inspectors reviewed the engineering change package, system drawings, stress analyses, post-modification tests, field design change requests, work orders, FW-10 trend data, corrective action

documents, and performed a system walkdown. The inspectors did not identify any significant concerns with the engineering change package.

.2.8 Equipment Environmental Qualification Requirements for Feedwater Regulating Bypass Valves HCV-1105 and HCV-1106

The inspectors reviewed Engineering Change 54173, implemented to provide environmentally qualified equipment to control feedwater regulating bypass valves HCV-1105 and HCV-1106. The purpose of the engineering change was to maintain the capability to control steam generator level during accident conditions during a high-energy line break in room 81. This capability is a nonsafety-related function of the valves; however, the valves must be qualified to operate in an adverse environment. Specifically, the valves are opened to provide an alternate path for auxiliary feedwater flow to the steam generators and must also function to close to avoid overfilling the steam generators. The inspectors reviewed the engineering change package, system drawings, post-modification tests, system operating procedures, master list for equipment qualification, field design change requests, work orders, preventive maintenance tasks, and corrective action documents. The inspectors did not identify any significant concerns with the engineering change package.

.2.9 Upgrade for High-Energy Line Break Volumetric Inspection

The inspectors reviewed Engineering Change 61599, implemented to replace existing two inch and larger socket welded joints with butt welds in selected portions of the chemical volume and control system and steam generator blowdown piping in room 13. Specifically, this modification ensured that the welded joints, between the affected systems containment penetration and the outboard isolation valves were accessible for volumetric inspection. The inspectors reviewed the engineering change package, system drawings, stress analyses, post-modification tests, field design change requests, work orders, and corrective action documents. The inspectors did not identify any significant concerns with the engineering change package.

.2.10 Pressurizer Heater Weld Configuration Change

The inspectors reviewed Engineering Change 54959, implemented to replace pressurizer heater number 26, with a revised weld design. Specifically, this modification incorporated an evaluation of the critical characteristics for an alternate replacement weld design consistent with Calculation FC 08074, "Pressurizer Heater Number 26, Weld Configuration," American Society of Mechanical Engineering, Section III, Design Report." The conclusion of the calculation established that the pressurizer heater replacement weld satisfied the requirements of ASME Code, Section III, and that the weld was qualified for the specified number of cycles defined in the Fort Calhoun pressurizer specification. The inspectors reviewed the design report, engineering change package, and the stress analysis. The inspectors did not identify any significant concerns with the engineering change package.

.2.11 Pipe Supports for Component Cooling Water Piping in Containment

The inspectors reviewed Engineering Change 54436, implemented to remove, upgrade, and install piping supports in the component cooling water system. The inspectors also reviewed Condition Report CR-2011-7938, which documented that the analysis of record, for the component cooling water piping to the containment coolers, did not adequately consider the additional heating and thermal stresses associated with a design basis accident. Accordingly, this design change was implemented to restore the affected pipe supports to the current design basis condition including extended power uprate conditions. The inspectors reviewed the design change documentation, including selected stress analysis calculations and conducted interviews with the cognizant design engineering personnel. The inspectors did not identify any significant concerns with the engineering change package.

.2.12 Replacement of Main Feedwater Check Valves FW-161 and FW-162

The inspectors reviewed Engineering Change 26174, implemented to replace the main feedwater check valves FW-161 and FW-162 and the associated restraints. Specifically, this modification replaced the existing check valves with an improved design which allowed inservice testing for closure stroking without having to remove the valves from their installed position. This modification was installed in conjunction with substitute replacement Engineering Change 29682, which replaced the main feedwater piping downstream of FW-161 and FW-162, up to the steam generators. This modification was implemented because the replacement check valves were physically longer than the existing components. The inspectors reviewed the engineering change package, system drawings, post-modification tests, field design change requests, work orders, and corrective action documents. The inspectors did not identify any significant concerns with the engineering change package.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

40A2 Problem Identification and Resolution

Review of Corrective Action Program Documents

a. Inspection Scope

The inspectors reviewed 55 corrective action program documents that identified or were related to 10 CFR 50.59 program and permanent plant modifications. The inspectors reviewed these documents to evaluate the effectiveness of corrective actions related to permanent plant modifications and evaluations of changes, tests, and experiments. In addition, corrective action documents written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the

problems into the corrective action system. The list of specific corrective action documents that were sampled and reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On August, 11, 2016, the inspectors presented the preliminary inspection results to Mr. S. Fatora, Acting Plant Manager, and other members of the licensee's staff. The licensee acknowledged the results as presented. While some proprietary information was reviewed during this inspection, no proprietary information was included in this report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

S. Fatora, Acting Plant Manager
Z. Wineinger, Design Engineering
R. Church, Design Engineering
P. Koneck-Wilwerding, Design Engineering
C. Cameron, Regulatory Assurance
K. Mann, Regulatory Assurance
J. Short, Director, Maintenance
C. Amundson, Service Manager, Operations
M. Bakhit, Design Engineering
M. Friedman, Design Engineering
M. Sarr, Design Engineering
B. Ward, Design Engineering
W. Phillips, Acting Manager, Nuclear Design Engineering
B. Currier, Manager, Engineering
M. Peak, Operations

NRC Personnel

M. Schneider, Senior Resident Inspector
S. Janicki, Acting Resident Inspector

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened

05000285/2016008-01	NCV	Failure to Obtain Prior NRC Approval for a Change When Required (Section 1R17.1.b)
---------------------	-----	--

LIST OF DOCUMENTS REVIEWED

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

10 CFR 50.59 Evaluations

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
15-110	EC 65749, Increasing Portable Fan Size and Changing Flow Path for Switchgear Room Supplemental Cooling	0
15-147	EC 66825, Inadvertent Digital Upgrade of Degraded Voltage Relays (OPLS)	0
15-184	EC 58161, Modification to Provide Electrical Isolation for Breaker Trip Control Circuits Associated with 4kV Circuit Breakers	0
15-187	EC 64574, Address EDG Load Shedding Concerns in Fire Area 36A by Rerouting Cables and Adding Coordinated Fuses and Isolation Switches	0
13-010	EC 29642, Elimination of FW-6 and FW-10 as Startup or Shutdown Pumps during Normal Plant Operations	0
14-055	EC 63785, Replace Pressurizer Heaters	0
14-077	EC 65174, Condensate Return Line in Turbine Building	0
14-055	EC 63785, Replace Pressurizer Heaters	0
14-024	EC 64675, Design Licensing Basis for Component Cooling Water System Surge Tank	2
14-055	EC 63785, Replace 36 Original High Power Densi Pressurizer Heaters With Improved Design	0
14-024	EC 64675, Design, Licensing Basis of Component Cooling Water (CCW) System Surge Tank (AC-2)	2
14-077	EC 65174, Turbine Building/ Condensate Return Pipe Repair	0
16-010	EC 55590, Modify Diesel Generator Control Circuit to Shut Off Booster Pump When Start Failure Occurs	0

10 CFR 50.59 Screenings

<u>Number</u>		<u>Date</u>
15-205	Replace SI-1A-M Per Large Motor Program	October 7, 2015
15-169	Mod to Provide Additional Isolation for Normally Open 480V Bus-Tie Breaker Close Coils	September 11, 2015
15-120	4160V Breaker Replacement	June 11, 2015
15-081	Replacement of Obsolete Fisher Limit Switch HCV-1559B-33	April 26, 2015
14-070	Scoping Analysis for Setpoint / Uncertainty Calculations	December 29, 2014
14-008	Improve DG Load Shed Scheme	October 7, 2014
14-054	EC 63785, Replace Pressurizer Heaters	0
15-227	EC 57530, CCW Flowmeter Upgrade	0
16-002	EC 66975, Evaluate Wall Thickness of Intake Structure Based on Reg Guide 1.76 Rev 1	0
14-037	EC 64646, Containment Spray Run-Out Modification	1
14-063	FC-08406, Applicable Wall Thickness for RW ASME Code Case	0
15-131	EC 66270, Structural Evaluation of Shutdown Cooling Heat Ex	0
15-156	EC 66682, Revise FC-01967 for Discrepancies and Safety Class	0
15-191	EC 58322, Modification to Reroute Cables EA-4954 and EB-4959	0
16-003	EC 67817, Auxiliary Feedwater Internal Replacement Valve	0
16-011	EC 58329, Condensate Storage Tank Inventory	0

Corrective Action Program Documents (CR-) (Issued)

2016-06311 2016-06667 2016-06690

Drawings

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
D-4197	HCV-1042A Control Valve Wiring Diagram	5 and 9
D-4196	HCV-1041A Control Valve Wiring Diagram	3 and 6
D-5157, Sheet 1	Conduit and Termination Details	0
D-5157, Sheet 2	CCW Junction Box Support Installation	0
11405-E-4	480 Volt Auxiliary Power One Line Diagram, P&ID	36
11405-E-5	480 Volt Auxiliary Power One Line Diagram, P&ID	32
11405-E-28, Sheet 1	Feedwater and Main Steam System Schematic, Control and Instrumentation	38 and 41
11405-E-66	Reactor Auxiliary Building Tray & Conduit Layout – Plan Operating Fl. El. 1025' 0" East	44
136B2709, Sheet 16	Elementary Diagram Electrical Control Valves and Pumps	17 and 18
136B2709, Sheet 14	Elementary Diagram Electrical Control Valves and Pumps	17 and 19

Facility Change (FC)

<u>Number</u>	<u>Title</u>	<u>Date</u>
38103	TR-408 Spent Fuel Pool Temperature Recorder	March 14, 2011

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
7105 Initial 50.59 LP	10 CFR 50.59 Process Training – Initial	08
PI-AA-126- 1001-F-01	Focused Area Self-Assessment	0
LIC-15-0119	10 CFR 50.59 Report, Quality Assurance (QA) Program Changes, Technical Specification Basis Changes, 10 CFR 71.106 Quality Assurance Program Approval, Aging Management Review, Commitment Revisions, and Revision of Updated Safety Analysis Report Revision for Fort Calhoun Station (FCS), Unit No. 1	December 9, 2015

Permanent Plant Modifications (EC)

<u>Number</u>	<u>Title</u>	<u>Date</u>
54244	EEQ Fuse Isolation For HCV-1041A/1042A	October 23, 2013
41956	Diesel Generator Engine Controls Upgrade	February 26, 2015
58770	Replacement Of Conax ECSA and Pigtails on Namco Limit Switches Below the Post DBA Submergence Level in Containment	January 6, 2016
55358	CCW Pump Motor Cable & Conduit Upgrade	February 23, 2015
26174	Replacement of Main Feedwater Check Valves FW-161 and FW-162	October 18, 2010
54436	Pipe Supports for CCW Piping in Containment	January 16, 2015
61599	Upgrade for High-Energy Line Break Volumetric Inspection	January 16, 2015
54959	Pressurizer Heater Weld Configuration	November 22, 2015
41587	Raw Water Strainer Upgrade	August 7, 2015
53202	Modify Piping and Supports for FW-10 Main Steam Supply in Response for High Energy Line Break Concerns	January 21, 2016
54173	EEQ Requirements for FWR Bypass Valves HCV-1105 and HCV-1106	July 30, 2015
38103	TR-408 Spent Fuel Pool Temperature Recorder	March 14, 2011

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
LS-AA-104	Exelon 50.59 Review Process	10
EM-RR-EX-0100	Application of Silicon Sealant on States Terminal Blocks in Containment and Room 81	7
PED-SEI-9	Setpoint/Tolerance Change and Review	28
CC-AA-103	Configuration Change Control For Permanent Physical Plant Changes	27
CC-AA-10	Configuration Control Process Description	8
CC-AA-112	Temporary Configuration Changes	24
LS-AA-104-1000	Exelon 50.59 Resource Manual	9
CC-AA-20	Configuration Management	2

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
LS-AA-104-1006	Exelon 50.59 Training and Qualification	4

Work Orders

<u>Number</u>	<u>Title</u>	<u>Date</u>
00428155 07	TESTING-MOD-EC 54244 ISOL FUSES FOR HCV-1041A/1042A	October 25, 2013
00475588 08	MOD-EC 58770 SEAL OF HCV-241-33A/B NAMCO LS'S IN CONTAINMENT	June 7, 2013
00475588 09	MOD-EC 58770 SEAL OF HCV-438A-33A/B NAMCO LS'S IN CNTMNT	June 7, 2013
00475588 10	MOD-EC 58770 SEAL OF HCV-438C-33A/B NAMCO LS'S IN CNTMNT	June 7, 2013

Calculations

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
FC07012	External Missiles due to Tornado Winds and Turbine Generator Overspeed	8
FC07249	Raw Water System Operability Curves - One Raw Pump Operation and Two Raw Pump Operation	0
FC07276	FCS RPZR - Design Report	1
FC07890	Steam to AFW Pump Code Check and HELB Analysis	0
FC08281	Tornado Missile Impact Evaluation of Sluice Gate Operators	2
FC08338	Steam to AFW Pump Code Check and HELB Analysis	0

Procedures

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
AOP-28	Auxiliary Feedwater System Malfunctions	18
ARP-CB-1,2,3/A2	Raw Water Strainer A Trouble	44
CC-AA-103	Configuration Change Control for Permanent Physical Plant Changes	27
IC-CP-01-2805A	Calibration of Raw Water Strainer AC-12A Pressure Switches PC-2805A and PA-2805A	8

Procedures

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
IC-RR-VX-0409	Diagnostic Testing of Air Operated Valves	17
IC-RR-VX-0501	Replacement of ASCO Solenoid Valve	4
IC-ST-RC-0003	Monthly Functional Test of Pressurizer Level Instrument Channels L-101X and L-101Y	33
LS-AA-104	Exelon 50.59 Review Process	10
LS-AA-104-1000	Exelon 50.59 Resource Manual	9
LS-AA-104-1006	Exelon 50.59 Training and Qualification	4
OI-AFW-1	Auxiliary Feedwater Actuation System Normal Operation	75
OP-ST-AFW-0001	Auxiliary Feedwater System Valve Alignment Check	20
OP-ST-AFW-0004	Auxiliary Feedwater Pump FW-10 Operability Test	30
OP-ST-FW-3002	Feedwater System Category A and B Valve Exercise Test	24
OP-ST-RW-3001	AC-10A Raw Water Pump Quarterly Inservice Test	37
OP-ST-RW-3002A	Raw Water System Category A and B Valve Exercise Test	14
OP-ST-VX-3011	Feedwater System Remote Position Indicator Verification Surveillance Test	9
PED-GEI-28	Preparation of Construction Work Orders	28
OI-VA-2	Auxiliary Building Ventilation System Normal Operation	48

Miscellaneous

<u>Number</u>	<u>Description or Title</u>	<u>Revision / Date</u>
EA08-011	Master List for Electrical Equipment Qualification	4
LIC-15-0119	10 CFR 50.59 Report, Quality Assurance (QA) Program Changes, Technical Specification Basis Changes, 10 CFR 71.106 Quality Assurance Program Approval, Aging Management Review, Commitment Revisions, and Revision of Updated Safety Analysis Report Revision for Fort Calhoun Station (FCS), Unit No. 1	December 9, 2015
NED-12-0133 DEN	Replacement of Motor for HCV-1042C (EC52116)	October 1, 2012
NED-13-0481 DEN	Calculation File - FC07890 Rev. 0, "Steam to AFW Pump Code Check and HELB Analysis"	October 23, 2013

Miscellaneous

<u>Number</u>	<u>Description or Title</u>	<u>Revision / Date</u>
PI-AA-126-1001-F-01	50.59 / Permanent Plant Modifications	0
TD C438.0020	Instructions for Installation, Operation, and Maintenance of Coffin Turbo Pump Type DEB Auxiliary Feed Pump	1
TD D935.0010	Installation, Operation, and Maintenance Manual for Delroyd Worm Gear Reducers	0
TD K143.0020	Installation and Dimensions for Kinney Automatic Self-Cleaning Strainers	1
TD K143.0030	Installation and Maintenance Instructions for Kinney Self-Cleaning Strainer	0

Work Orders

394135 420953 428160 317862 532571 580212

Condition Reports (Reviewed)

2016-06407	2016-06628	2016-06662	2016-06663	2016-06667
2016-02943	2016-02608	2016-02596	2016-02595	2016-02520
2016-03472	2016-02304	2016-02290	2016-02187	2016-02185
2016-02124	2016-02068	2015-13719	2015-12984	2015-09903
2015-06757	2014-15393	2013-20253	2013-19345	2013-18397
2013-18308	2013-18009	2013-16653	2013-14363	2013-08872
2013-08931	2013-08695	2013-07461	2013-06481	2013-05539
2012-17455	2012-17014	2012-16834	2012-15793	2012-13553
2012-12550	2012-10734	2012-10732	2012-09880	2012-09602
2012-07901	2012-06452	2012-05678	2012-05253	2012-03938
2012-03828	2012-02594	2012-00881	2011-10397	2011-04092
2013-15338	2013-05508	2013-05206	2010-01591	2013-20657
2016-02809	2016-06228	2012-13441	2012-15339	2013-16954