



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

October 9, 2014

Mr. Lawrence Coyle
Site Vice President
Entergy Nuclear Northeast
James A. FitzPatrick Nuclear Power Plant
P.O. Box 110
Lycoming, NY 13093

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT
NRC POST - APPROVAL LICENSE RENEWAL INSPECTION REPORT
05000333/2014010

Dear Mr. Coyle:

On August 28, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the James A. FitzPatrick Nuclear Power Plant (JAFNPP). The enclosed inspection report documents the inspection results, which were discussed on August 28, 2014, with Mr. Brian Sullivan, General Manager of Plant Operations, and other members of your staff.

The inspection examined the actions taken to complete commitments made as part of your application for a renewed license. The inspectors reviewed selected aging management programs, observed activities, reviewed documented results, and interviewed station personnel to determine if the selected commitments had been fulfilled.

No NRC-identified findings or self-revealing findings were identified during this inspection. The NRC did not identify any instances of incomplete commitments with respect to timeliness or adequacy. Based on the results of this inspection, the NRC concluded the commitments are being tracked to completion and there is reasonable assurance aging will be effectively managed during the period of extended operation.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 of the NRC's "Rules of Practice," 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 component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (Public Electronic Reading Room).

Sincerely,

/RA/

Mel Gray, Chief
Engineering Branch 1
Division of Reactor Safety

L. Coyle

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Docket No. 50-333
License No. DPR-59

Enclosure: Inspection Report 05000333/2014010
w/Attachment: Supplementary Information

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 Site Vice President
 Entergy Nuclear Northeast
 James A. FitzPatrick Nuclear Power Plant
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Sincerely,
/RA/
 Mel Gray, Chief
 Engineering Branch 1
 Division of Reactor Safety

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No. 50-333

License No. DPR-59

Report No. 05000333/2014010

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: James A. FitzPatrick Nuclear Power Plant

Location: Scriba, NY

Dates: August 11 to 29, 2014

Inspectors: Michael Modes, Sr. Reactor Engineer
Kevin Mangan, Sr. Reactor Engineer
Suresh Chaudhary, Reactor Engineer
Stephanie Galbreath, Reactor Engineer

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

SUMMARY

IR 05000333/2014010; 8/11-29/2014; James A. FitzPatrick Nuclear Power Plant (JAFNPP); Post-Approval Site Inspection For License Renewal.

This NRC team inspection was performed by four regional inspectors. The inspection was completed in accordance with NRC Manual Chapter 2516 and Inspection Procedure 71003.

The inspection examined the actions taken to complete commitments made by Entergy as part of an application for a renewed license. No NRC-identified findings or self-revealing findings were identified during this inspection. The NRC did not identify any instances of incomplete commitments with respect to timeliness or adequacy. Based on the results of this inspection, the NRC concluded the commitments were being tracked to completion and there is reasonable assurance aging will be effectively managed during the period of extended operation.

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA2 Post-Approval Site Inspection For License Renewal (71003)

The purpose of this team inspection was to verify the license conditions added as part of the renewed operating license, regulatory commitments, and selected aging management programs are implemented and/or completed in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54, "Requirements for the Renewal of Operating Licenses for Nuclear Power Plants."

The reviewed commitments, license conditions, and aging management programs were selected based on the results of previous license renewal audits and inspections of aging management programs; the complexity in implementing a commitment; and the extent to which the baseline inspection programs will inspect attributes of the commitment, license condition or aging management program. Consideration was given to the amount of time since the renewed license was granted and beginning of the period of extended operation.

The commitments reviewed by this inspection are recorded in NUREG-1905, "Safety Evaluation Report Related to the License Renewal of James A. Fitzpatrick Nuclear Power Plant," Appendix A, issued January 24, 2008 (ADAMS Accession No. ML080250372). For each commitment the inspectors reviewed supporting documents including completed surveillances, inspections, analysis, and conducted interviews to verify the licensee completed the necessary actions to comply with the license conditions or commitments.

This inspection also verified the updated final safety analysis report (UFSAR) included any newly identified systems, structures, and components that should have been within the scope of the license renewal program and subject to an aging management review or time limited aging analysis pursuant to 10 CFR 54.37(b). The inspectors verified that the descriptions of the aging management programs were contained in the UFSAR and that the descriptions of the programs were consistent with the programs implemented by the licensee. Lastly this inspection verified the licensee managed changes to the UFSAR supplement in accordance with 10CFR 50.59; and managed changes to regulatory commitments in accordance with Nuclear Energy Institute (NEI) 99-04, "Guidelines for Managing NRC Commitment Changes" as endorsed by Regulatory Issue Summary (RIS) 2000-017.

.1 License Conditions

a. Inspection Scope

The inspectors verified that Entergy was in compliance with the following license conditions:

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T. "License Renewal - UFSAR supplement submitted pursuant to 10 CFR 54.21 (d), as revised during the license renewal application review process, and as supplemented by Appendix A of NUREG-1905, "Safety Evaluation Report Related to the License Renewal of James A. Fitzpatrick Nuclear Power Plant," dated April 2008, describes certain programs to be implemented and activities to be completed prior to the period of extended operation (PEO).

The licensee shall implement those new programs and enhancements to existing programs no later than the PEO date.

The licensee shall complete those inspection and testing activities by the PEO date.

The licensee shall notify the NRC in writing within 10 days after having accomplished item (a) above and include the status of those activities that have been or remain to be completed in item (b) above."

UFSAR Supplement Changes - The UFSAR supplement, as revised, submitted pursuant to 10 CFR 54.21 (d), shall be included in the next scheduled update to the UFSAR required by the 10 CFR 50.71 (e)(4) following the issuance of this renewed operating license. Until that update is complete, Entergy Nuclear Fitzpatrick, LLC (ENF) and Entergy Nuclear Operations, Inc. (ENO) may make changes to the programs and activities described in the supplement without prior Commission approval, provided that ENF and ENO evaluate such changes pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that Section V." "Capsule withdrawal schedule - All capsules in the reactor vessel that are removed and tested must meet the test procedures and reporting requirements of the most recent NRC-approved version of the Boiling Water Reactor Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP) appropriate for the configuration of the specimens in the capsule. Any changes to the capsule withdrawal schedule, including spare capsules, must be approved by the NRC prior to implementation. All capsules placed in storage must be maintained for future insertion. Any changes to storage requirements must be approved by the NRC, as required by 10 CFR Part 50, Appendix H."

On a sampling basis, the inspectors verified that Entergy staff had completed the necessary actions to comply with the license conditions that are a part of the renewed operating license, and had implemented the aging management programs included in the NRC staff's license renewal safety evaluation report.

b. Findings

No findings were identified.

.2 Commitment Management

a. Inspection Scope

During this inspection the inspectors verified that changes, if any, to these commitments were identified and properly reviewed and approved. The inspectors concluded Entergy was applying the guidelines for commitment management contained in NEI 99-04 [Revision 0], "Guidelines for Managing NRC Commitment Changes," (ADAMS Accession No. ML0036800880) when informing the NRC about this change.

Because no changes were made prior to the beginning of this inspection, the inspectors reviewed the results of Nuclear Reactor Regulation (NRR) audits of the commitment management system (NRR Audit Reports, ADAMS Accession Nos. ML092390460 9/1/2009 and ML13030A12, 3/3/13) which resulted in the NRR staff concluding "JANPP has implemented NRC commitments on a timely basis, and has implemented an effective program for managing NRC commitment changes."

The inspectors noted the implementation of the license renewal aging management program, "Fire Water Program," included a commitment to perform wall thickness evaluations at intervals during the period of extended operation. The inspectors determined, Entergy initiated condition report CR-JAF-2014-04465 to implement a commitment change per EN-LI-110, "Commitment Management Program," to revise the wording "and at intervals thereafter, during the period of extended operation" to reflect the results of the initial evaluations which determined that no further inspections are required during the period of extended operation. This conclusion was documented in PMRQ # 50057364-06, "Inspect Fire Systems Piping." The inspectors concluded Entergy staff managed this commitment in accordance with NEI 99-04 [Revision 0].

b. Findings

No findings were identified.

.3 10 CFR 54.37(b)

a. Inspection Scope

The inspectors reviewed documentation to determine whether systems, structures, and components that would have been subject to license renewal were identified. The inspectors reviewed EN-DC-115 "Engineering Change Analysis," and considered that a renewed license was issued on September 9, 2008. The inspectors observed that EN-DC-115 was not revised to identify information necessary to assure compliance with 10 CFR 54.37(b) until July 7, 2009. The inspectors determined Entergy staff had reviewed all engineering changes performed during the interim to determine if any systems, structures, or components should have been subject to an aging management review.

Entergy staff completed a review which resulted in the High Energy Line Break door and Fire Door 76FDR-DG-272-11 being added to the Structures Monitoring Program. The inspectors reviewed SEP-LR-JAF-001, Rev 0, "10 CFR 54.37(b) Determination" and EN-DC-115, Revision 16, "Engineering Change Process." The inspectors reviewed the screening results of 52 randomly selected engineering changes (Attachment 9.13, "10 CFR 54.37 (b) Review Determination") to verify no additional components should have been included and only the High Energy Line Break Door and Fire Door 76FDR-DG-272-11 were subject to an aging management review. The inspectors concluded Entergy was in compliance with applicable requirements and the late documentation was a minor issue that had been identified and corrected by Entergy staff.

b. Findings

No findings were identified.

.4 Commitments

Commitment 1 - "Implement the Buried Piping and Tanks Inspection Program as described in License Renewal Application (LRA) Section B.1.1."

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, NRC Safety Evaluation Report (SER), and the associated implementation procedure. The inspectors determined that the buried piping and tanks inspection program included preventive measures to mitigate corrosion and inspections will manage the effects of corrosion on the pressure-retaining capability of buried carbon steel, copper alloy, gray cast iron, and stainless steel components. The inspectors concluded that Entergy staff had performed adequate evaluations, including review of industry experience and plant operating history to determine the buried piping and tanks inspection program will be fully implemented prior to the period of extended operation.

b. Findings

No findings were identified.

Commitment 2 - "Enhance the BWR CRD Return Line Nozzle Program to examine the CRDRL nozzle-to-vessel weld and the CRDRL nozzle inside radius section per Section XI Table IWB-2500-1, Category B-D Items B3.90 and B3.10."

a. Inspection Scope

The inspectors reviewed Entergy Letter JAFP-07-0048, to NRC, dated April 6, 2007, submitting an amendment to the license renewal application originally submitted on July 31, 2006. This amendment contains the above commitment. Entergy staff cut and capped the control rod drive return line nozzle (CRDRL). In response to a stress corrosion crack in the capped nozzle, a nickel-based Alloy 52 structural weld metal

overlay was installed in 2000. On October 26, 2000 the NRC approved the Entergy proposed alternative of continued inspection by ultrasonic testing in lieu of radiography, using American Society of Mechanical Engineers (ASME) Code Case N-504-1. In their application for a renewed license, JAFNPP described a number of exceptions and enhancements to the NUREG-1801 XI.M6 program. The exceptions are:

The dissimilar weld between the CRDRL nozzle and end cap is not subject to in-service inspection (ISI). The flow capacity test required by NUREG-0619 was not performed prior to capping the CRDRL nozzle. The inspectors determined this exception was permitted by NRC letter dated August 25, 1983. The extent and schedule of inspection, per NUREG-0619, were not followed and the acceptance criteria stipulated were not applied because the CRDRL nozzle was over-laid without removal of the crack.

Although required by ASME Section XI, Table IWB-2500-1, Category B-D, Items B3.90 and B3.100, for an ISI Program B plant the inspectors noted the planned CRDRL nozzle (nozzle N-9), nozzle-to-vessel weld and nozzle inside radius inspections were an enhancement to NUREG 1801, "Generic Aging Lessons Learned (GALL) Report", (September 2005) part XI.M6. The inspectors also noted the Entergy staff identified that their renewal application originally misidentified this as Items B3.10 and B3.20 which is applicable to an Inservice Inspection Program A plant. Because JAFNPP is an ISI Program B this was corrected by Entergy in the JAFP-06-0109 letter to the NRC dated July 31, 2006.

The inspectors verified implementation by reviewing JAFNPP SEP-ISI-007, Revision 4, "Inservice Inspection Program Fourth Ten-Year Interval Program Section" which, in Section 1.1.3.5 included the commitment for the inspection of the nozzle-to-vessel weld. The inspection of the nozzle-to-vessel weld was implemented by Work Order 00195956, "R19 ISI examination of RPV Nozzle to Vessel Weld N-9, N-9-1R" and reported in Westdyne "Outage R019 In service Inspection Summary Fall 2010," dated September 27, 2010.

The inspectors noted that the inspection of the nozzle inner radius is contained in SEP-RVI-004, Revision I, "JAF Reactor Vessel Internals (RVI) Inspection Program Plan", dated September 5, 2012. The EVT-1 inspection of the CRDRL nozzle inner radius was implemented by Work Order Package 00196532, Task 8, "R19 IVVI Examination of CRD Components." The results of the examination were subsequently reported in IVVI-Final Report GFIT1-R19-312034.

b. Findings and Observations

No findings were identified.

Commitment 3 – "Enhance the Diesel Fuel Monitoring Program to periodic draining, cleaning, visual inspections, and ultrasonic measurement of the bottom surfaces of the fire pump diesel fuel oil tanks, EDG day tanks, and EDG fuel oil storage tanks to ensure that significant degradation is not occurring. Enhance the Diesel Fuel Monitoring Program to specify acceptance criteria for UT measurements of diesel generator fuel storage tanks within the scope of this program."

Enclosure

a. Inspection Scope

The inspectors reviewed the license renewal application (LRA), NRC SER, commitment implementation plan, implementation procedures, and associated work orders to determine the requirements to meet the commitment and whether Entergy had implemented adequate measures to meet the commitment. The inspectors also discussed the commitment with plant staff and license renewal personnel to determine what actions Entergy had credited to meet the commitment. Specifically the inspectors verified that the emergency diesel generator (EDG) fuel oil storage tanks, day tanks and fire pump diesel fuel oil tank had been included in the inspection and sampling program. The inspectors reviewed Entergy's procedures for sampling the tanks to verify the procedures directed sampling of the bottom of each tank.

The inspectors also reviewed work orders for preventative maintenance procedures to verify that Entergy planned to empty, clean, visually inspect and perform ultrasonic testing of the bottom of each tank every ten years. Finally, the inspectors reviewed the calculations used to determine the acceptance criteria for the ultrasonic testing to determine if appropriate corrosion limits and tank thickness limits had been determined.

The inspectors concluded that Entergy staff had performed adequate evaluations, including appropriate scoping of all fuel oil tanks into the aging management program. The inspectors also determined that program-level documents provided adequate guidance to ensure that the required inspection and testing of the in scope diesel fuel oil tanks met the requirements of the commitment.

b. Findings

No findings were identified.

Commitment 5 – “Enhance the Fire Protection Program to inspect fire barrier walls, ceiling, and floors at least once every refueling outage. Inspection results will be acceptable if there are no visual indications of degradation such as cracks, holes, spalling, or gouges. Enhance the Fire Protection Program to inspect at least one seal of each type every 24 months.”

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, NRC SER, associated implementation procedure, performed a walkthrough inspection, and discussed the status of implementation of the commitment with Entergy technical personnel. The inspectors determined that Entergy staff had implemented updated procedures to include the inspection of fire barrier walls, ceiling, and floors at least once every refueling outage and to inspect at least one seal of each type every 24 months.

b. Findings

No findings were identified.

Commitment 6 – “Enhance the Fire Water Program to include inspection of hose reels for corrosion. Acceptance criteria will be enhanced to verify no significant corrosion. Enhance Fire Water Program to include visual inspection of spray and sprinkler system internals for evidence of corrosion. Acceptance criteria will be enhanced to verify no significant corrosion. Enhance the Fire Water Program to include that a sample of sprinkler heads will be inspected using guidance of NFPA 25 (2002 Edition) Section 5.3.1.1.1. NFPA 25 also contains guidance to repeat sampling every 10 years after initial field service testing. Enhance Fire Water Program to include that wall thickness evaluations of fire water piping will be performed on system components using non-intrusive techniques to identify evidence of loss material due to corrosion. These inspections will be performed before the end of the current operating term and at intervals thereafter during the period of extended operation. Results of the initial evaluations will be used to determine the appropriate inspection interval to ensure aging effects are identified prior to loss of intended function.”

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, NRC SER, associated implementation procedure, performed a walkthrough inspection, and discussed the status of implementation of the commitment with Entergy technical personnel. The inspectors reviewed samples of the inspection results associated with the wall thickness evaluations of the fire water piping to identify evidence of loss material due to corrosion. The inspectors also reviewed the inspection program that included inspection of the spray and sprinkler system internals for evidence of corrosion.

The inspectors concluded that Entergy staff had performed adequate evaluations, including reviews of industry experience and plant operating history to determine appropriate aging effects. The inspectors further determined that program-level documents provided adequate guidance to ensure that the aging effects were appropriately identified and addressed.

b. Findings

No findings were identified.

Commitment 8 – “Implement the Metal-Enclosed Bus Inspection Program as described in LRA Section B.1.17.”

a. Inspection Scope

The inspectors reviewed the license renewal application, NRC SER, commitment implementation plan, implementation procedures, and associated work orders to determine the requirements to meet the commitment and whether Entergy had implemented adequate measures to meet the commitment. The inspectors also discussed this commitment with applicable plant staff and license renewal personnel to determine the actions taken by Entergy to meet the commitment. The inspectors reviewed procedures and completed work orders associated with these electrical SSCs

to verify whether the inspection program effectively managed the aging effects and appropriately inspected for evidence of electrical stress, fatigue, corrosion, wear, and adequate bolting as described in Section B.1.17 of the license renewal application. Finally, the inspectors reviewed drawings, completed work orders, and reviewed pictures to determine whether the inspections had been performed in accordance with the inspection program. The inspectors concluded that Entergy staff had performed an adequate inspection of in scope metal-enclosed busses. The program included reviews of industry experience and plant history to determine appropriate inspections to ensure that aging effects were appropriately evaluated. Also, program-level documents provided adequate guidance to ensure that the aging effects of electrical SSCs were appropriately identified and addressed.

Commitment 11 – “Enhance the Oil Analysis Program to periodically sample lubricating oil in the security generator, the fire pump diesel, as well as the oil internal to underground oil filled cables. Enhance the Oil Analysis Program to include viscosity and neutralization number determination of oil samples from components that do not have regular oil changes. Enhance the Oil Analysis Program to include particulate and water content for oil replaced periodically.”

a. Inspection Scope

The inspectors reviewed the license renewal application, NRC SER, commitment implementation plan, implementation procedures, and associated work orders to determine the requirements to meet the commitment and whether Entergy had implemented adequate measures to meet the commitment. The inspectors also discussed this commitment with applicable plant staff and license renewal personnel. Specifically, the inspectors verified that security generator and fire pump diesel were included in the scope of the procedure. The inspectors also verified that in scope SSCs were included in the oil analysis program and the oil samples were analyzed for particulate, water content, viscosity, and neutralization and appropriate acceptance criteria had been established. Finally, the inspectors reviewed oil sample analysis results to determine if all required analyses had been performed and results were within established acceptance criteria.

The inspectors concluded that Entergy staff had enhanced the lube oil analysis program to ensure all characteristics described in the license commitment were analyzed. The inspectors noted that oil sampling of oil filled cables had been added to the program and preventative maintenance orders were in place to perform the samples; however, the cables had not been sampled and analyzed at the time of the inspection. The inspectors also determined that program-level documents provided adequate guidance to ensure that the oil sampling and analysis would be performed as described in the commitment.

b. Findings

No findings were identified.

Commitment 12 – “Implement the One - Time Inspection Program as described in LRA Section B.1.21.”

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, NRC SER, associated implementation procedure, and a sample of one-time inspections. The inspectors reviewed samples of work orders completed for one-time inspections, the results of the samples, and corrective actions taken by Entergy. The one-time inspection program included activities to verify effectiveness of an aging management program in the areas of water chemistry control programs, internal surfaces of high pressure coolant injection system components containing untreated air, surfaces of carbon steel and cast iron plant drain components normally exposed to indoor air, internal surfaces of carbon steel emergency diesel generator system components containing untreated air, and the internal surfaces of stainless steel and aluminum components in the radioactive waste system containing raw water. The inspectors concluded that Entergy staff had performed adequate evaluations, including reviews of industry experience and plant operating history. The inspectors further determined that program-level documents provided adequate guidance to ensure that the aging effects were appropriately identified and addressed.

b. Findings

No findings were identified.

Commitment 14 – “Enhance the Reactor Vessel Surveillance Program to include the data analysis, acceptance criteria, and corrective actions described in LRA Section B.1.24.”

a. Inspection Scope

Entergy staff was implementing the guidelines contained in Boiling Water Reactor Vessel Internals Program (BWRVIP), Integrated Surveillance, BWRVIP-86, Revision 1, which incorporated the BWRVIP-116 referenced in LRA B.1.24. This program was approved by the NRC in License Amendment 285 as stated in LRA Section B.1.24. This program uses surveillance capsules irradiated in host BWR plants (other than JAFNPP). The capsules in the JAFNPP vessel are spares and are not currently scheduled for withdrawal. The JAFNPP shift in the reference temperature for the null-ductility transition of the vessel material is updated as the Vessel Internals Program (VIP) data becomes available.

The inspectors reviewed SEP-FTP-JAF, Revision 0, “Reactor Vessel Fracture Toughness and Surveillance Material Testing at James A. Fitzpatrick Nuclear Power Stations,” dated 5/23/14 and verified the guideline essential variables of BWRVIP-86 were included. The inspectors verified the data in BWRVIP-135, Revision 2, “Integrated Surveillance Program (ISP) Data Source Book and Plant Evaluations,” dated October 2009, and the data accurately represented the JAFNPP vessel status. The inspectors noted the

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JAFNPP target weld (27204/12008) and plate (C3376-2) were represented by LaSalle Unit 1 capsule 300° and capsules SSP D and I.

b. Findings

No findings were identified.

Commitment 15 – “Implement the Selective Leaching Program in accordance with the program as described in LRA Section B.1.25.”

a. Inspection Scope

The inspectors reviewed the license renewal application, NRC SER, implementation plan, implementation procedures, and associated work orders to determine the requirements to meet the commitment and whether Entergy had implemented adequate measures to meet the commitment. The inspectors also discussed this commitment with applicable plant staff and license renewal personnel to determine what components had been determined to be in the scope of the program and the results of the inspection of components sampled for evaluation of potential leaching. The inspectors reviewed procedures, drawings, completed work orders, and reviewed pictures taken of sampled components, in the associated work orders, used to evaluate if leaching is occurring in susceptible components. The inspectors reviewed these documents to verify the inspection program had adequate acceptance criteria, the type and number of components examined met the sampling criteria, and the inspection results were adequate to determine whether leaching of susceptible components was occurring. Finally, the inspectors reviewed the program procedures to evaluate the capability of the program to identify and manage aging effects due to leaching in the period of extended operation.

The inspectors concluded that Entergy staff had performed adequate evaluations, including reviews of industry experience and plant history to determine if leaching was occurring on susceptible components. Also program-level documents provided adequate guidance to ensure that evidence of leaching on susceptible components would be appropriately identified and addressed.

b. Findings

No findings were identified.

Commitment 16 – “Enhance the Structures Monitoring Program procedure to:

- Specify that manholes, duct banks, underground fuel oil tank foundations, manway seals and gaskets, hatch seals and gaskets, underwater concrete in the intake structure, and crane rails and girders are included in the program.
- Include guidance for performing structural examinations of elastomers and rubber components to identify cracking and change in material properties.

Enclosure

- Include guidance for performing periodic inspections to confirm the absence of aging effects for lubrite surfaces in the drywell radial beam seats and for lubrite surfaces in the torus support saddles,
- Perform an engineering evaluation on a periodic basis (at least once every five years) of groundwater samples to assess aggressiveness (pH < 5.5, chloride >500 ppm and Sulfate > 1500) of groundwater to concrete.
- Inspect any inaccessible concrete areas that may be exposed by excavation for any reason, or any inaccessible area where observed conditions in accessible areas, which are exposed to the same environment, show that significant concrete degradation is occurring.”

a. Inspection Scope

The inspectors reviewed documentation, applicable procedures and discussed the status of implementation of the commitment with the Entergy technical and management staff to verify that the enhancements identified in this commitment were incorporated into program documents and implementing procedures.

The inspectors determined the applicant had revised, and enhanced, Procedure EN-DC-150, Rev 2, Attachment 9.16, “FitzPatrick Maintenance Rule Structures” to incorporate specific structures covered by the commitment. The revised procedure attachment is applicable to both the maintenance rule and non-maintenance rule structural monitoring. The attachment is arranged by components and structures on the basis of distinct areas, e.g. Containment Building; Water Control Structures; Turbine, Auxiliary Building and Other Structures, and Bulk Commodities for maintenance rule components and structures, and similar groupings for Ground Water, Screen Well/Pump-house, Turbine Building Complex, and Bulk Commodities not covered by the maintenance rule.

For example, the non-maintenance rule group for Turbine Building Complex and Yard Structures listed:

- Concrete Floor Slabs, Interior Walls and Ceilings,
- Concrete Shield Walls,
- Condensate Storage Tank Walls (below grade portion)
- Control Room Ceiling Support System,
- Crane Rails and Girders,
- Duct Banks and Manholes (concrete),
- Foundations
- Masonry Walls (blocks, brick, mortars),
- Metal I Sidings,
- Steel Roof Decking,
- Structural Steel (carbon, stainless, galvanized steel beams, columns and plates)

And Bulk Commodities Group, for example, included, but was not limited to, the following specific items:

- Flood Curbing (concrete and steel)
- Manway Hatches and Hatch Covers
- Penetration Sealants (flood and radiation)
- Penetration Sleeves
- Roof Elastomers
- Rubber Seals and Gaskets

The inspectors noted that ACTS98-35236 specified inclusion of seismic gaps between major structures and surrounding foundations. The evaluation and acceptance criteria of groundwater samples were specified in Note 6 of the Attachment 9.16.

The inspection of Drywell radial beam support seats and lubrite surfaces were covered in paragraph 5.6.4, and structural Elastomers in paragraph 5.9.5 of procedure EN-DC-150, Rev. 6. Tank and Tank foundations are covered by paragraph 5.7 and 5.13.2 of the same procedure.

b. Findings

No findings were identified.

Commitment 17 – “Implement the Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program as described in LRA Section B.1.28.”

a. Inspection Scope

The purpose of the Cast Austenitic Stainless Steel program is to assure that reduction of fracture toughness due to thermal aging and radiation embrittlement will not result in loss of the intended function. The potential for embrittlement is dependent on ferrite level, operating temperature, chemical composition, casting methods, and fluence level. The effect of embrittlement on the performance of the component is dependent on the stress state of the component during service. Components that do not experience high loads, that have embrittlement, may not be of concern.

The inspectors determined that Entergy staff was implementing BWRVIP-234, “Thermal Aging and Neutron Embrittlement Evaluation of Cast Austenitic Stainless Steels for BWR Internals,” December 2009. This generic evaluation identified the components of concern of which the following apply to JAFNPP:

- Orificed Fuel Support
- Control Rod Guide Tube Base
- Core Spray Sparger Nozzle Elbows
- Jet Pump Transition Piece

The evaluation concluded the JAFNPP specific components do not require an augmented evaluation based on calculating the ferrite levels below the screen threshold, the Jet Pump Transition Piece and Core Spray Sparger Nozzle Elbows have adequate fracture toughness, and the end-of-life fluence level at the Control Rod Guide Tube base and Core Spray Sparger Nozzle elbows is less than the threshold screening level.

In JAF-RPT-09-LR028, Revision 0, "Review of the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program for License Renewal Implementation," dated 12/6/10, Entergy staff concluded, "BWRVIP-234 fulfills the requirements of the CASS Embrittlement Program." At the time they concluded BWRVIP-234 fulfills the requirements of the CASS Embrittlement Program, BWRVIP-234 had not been submitted to the NRC for review. BWRVIP-234 was subsequently submitted to the NRC and on September 29, 2011, the NRC sent the Vessel Inspection Program a number of technical questions (ML112630638) which the industry responded to on September 18, 2011 (ML12265A078).

This resulted in an additional request for information from the NRC which inquired whether the 6% calculation tolerance of the Hull's equivalence for delta ferrite in NUREG/CR-4513, Revision 1, "Estimation of Fracture Toughness of Cast Stainless Steels During Thermal Aging in LWER Systems," should not be added to the ferrite numbers derived by BWRVIP-234 in Table 3-2 and the tabulation in Appendix A. At the time of the inspection, a response had not yet been submitted to the NRC.

The inspectors concluded that Entergy staff implemented the commitment by including the data analysis and acceptance criteria of BWRVIP-234. The inspectors observed the resolution of the question about tolerance may result in Entergy staff performing supplementary examinations if the 6% addition ultimately causes some of their components to exceed the inspection threshold. The NRC inspectors verified that Entergy staff tracked this action by including a statement to "monitor BWRVIP-234 for future actions concerning the CASS program" (SEP-RVI-004, Revision 2, at 1.2.5).

b. Findings

No findings were identified.

Commitment 18 – "Enhance the Water Chemistry Control – Auxiliary Systems Program to include guidance for sampling the control room and relay room chilled water, decay heat removal cooling water, and the security generator jacket cooling water."

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, NRC SER, and associated implementation procedure. The water chemistry control for the auxiliary systems program procedure was enhanced to include guidance for sampling the control room and relay room chilled water, decay heat removal cooling water, and the security generator jacket cooling water. The inspectors concluded that Entergy staff had

performed adequate evaluations, including reviews of industry experience and plant operating history. The inspectors further determined that program-level documents provided adequate guidance to ensure that the aging effects were appropriately identified and addressed.

b. Findings

No findings were identified.

Commitment 20 – “At least 2 years prior to entering the period of extended operation, for the locations identified in NUREG/CR-6260 for BWRs of the JAFNPP vintage, JAFNPP will implement one or more of the following:

1. Refine the fatigue analyses or develop new analyses (Class 1 Residual Heat Removal piping and Class 1 feedwater piping locations) if necessary, to determine valid Cumulative Usage Factor (CUFs) less than 1 when accounting for the effects of reactor water environment. This includes applying the appropriate F_{en} factors to valid CUFs determined in accordance with one of the following options.
 - For locations, including NUREG/CR-6260 locations, with existing fatigue analysis valid for the period of extended operation, use the existing CUF to determine the environmentally adjusted CUF.
 - More limiting JAFNPP-specific locations with a valid CUF may be added in addition to the NUREG/CR-6260 locations.
 - Representative CUF values from other plants, adjusted to or enveloping the JAFNPP plant specific external loads may be used if demonstrated applicable to JAFNPP.
 - For locations, including NUREG/CR-6260 locations, an analysis using the NRC-approved ASME Code 2001 edition up to and including 2003 addendum, may be performed to determine a valid CUF.
2. The determination of F_{en} will account for operating time with normal water chemistry and operating time with hydrogen water chemistry.
3. Manage the effects of aging due to fatigue at the affected locations by an inspection program that has been reviewed and approved by the NRC (e.g., periodic non-destructive examination of the affected locations at inspection intervals to be determined by a method acceptable to the NRC).
4. Repair or replace the affected locations before exceeding a CUF of 1.0.”

a. Inspection Scope

The inspectors determined that JAFNPP piping was designed and built to USAS B31.1.0, 1967 Edition. The design basis for this standard is to assume an unattainably,

high number of cycles for any piping so that a separate fatigue calculation or monitoring program is unnecessary. As a consequence of this design approach no governing baseline fatigue analysis was required.

For 1. a., above, JAFNPP evaluated the limiting locations, provided in NUREG/CR-6260, that are sensitive to environmental effects. Using the guidance contained in NUREG/CR-5704, for austenitic stainless steel, NUREG/CR-6583, for carbon and low alloy steel, and NUREG/CR-6909, for nickel alloys, Entergy staff calculated the environmental affects to be less than a cumulative usage factor of less than one (JAF-CALC-11-00039).

The inspectors determined the confirmatory analysis, implemented to comply with 1.a., obviated the necessity of 2 and 3. Cumulative usage factors will remain below one, making repair or replacement under part 4 unnecessary.

b. Findings

No findings were identified.

Commitment 21 – “Enhance the BWR Vessel Internals Program to inspect fifteen (15) percent of the top guide locations using enhanced visual commitment inspection techniques. EVT-1, within the first 18 years of the period of extended operation, with at least one-third of the inspections to be completed within the first six (6) years and at least two-thirds within the first 12 years of the period of extended operations. Locations selected for examination will be areas that have exceeded the neutron fluence threshold.”

a. Inspection Scope

The inspectors observed that NUREG-1801, “Generic Aging Lessons Learned”, (GALL) AMP XI.M9 established a neutron fluence threshold of 5×10^{20} n/cm² @ E>1.0 MeV above which EVT-1 (enhanced visual technique) must be performed on 5% of the top guide beam locations. The BWRVIP inspection program for the top guide is discussed in Electric Power Research Institute report EPRI TR-107285, “BWR Vessel and Internals Project, BWR Top Guide Inspection and Flaw Evaluation Guidelines (BWRVIP-26),” December 1996. This report was approved by the NRC December 7, 2000.

The inspectors determined BWRVIP-26 also uses 5×10^{20} n/cm² @ E>1.0 MeV as the threshold fluence beyond which components could be at an increased risk of developing cracks. BWRVIP-26 states that the generically calculated fluence on the top guide for 60 years is 6×10^{20} n/cm², exceeding the damage threshold. Although the generic conclusion of BWRVIP-26 is that a single failure at this location has no safety consequence, and no inspection was necessary, the NRC is concerned that multiple failures of top guide beams are possible when the threshold fluence is exceeded. According to BWRVIP-26, multiple location cracks have been observed in top guide beams at the Oyster Creek Nuclear Plant. In addition, baffle former bolts on PWRs that exceeded the threshold fluence have had multiple failures.

As a consequence Entergy staff revised EN-DC-130, Revision 4, "Entergy Reactor Vessel Internals Management (RVIM) Program", dated February 8, 2013, to include Commitment 21. The inspectors determined this commitment is implemented in SEP-RVI-004, Revision 1, "JAF Reactor Vessel Internals (RVI) Inspection Program Plan, Revision 2, dated 5/15/2013, which reports in Appendix D, at 3.1: "The examinations performed to date have not identified any indication requiring evaluation." The inspectors verified this statement by reviewing JAF RF019 IVVI Top Guide Data Sheet contained in the IVVI Final Report GFEIT 1-R19-312034, dated 9/22/2010.

b. Findings

No findings were identified.

Commitment 22 – "Enhance the BWR Vessel Internals Program to ensure the effects of aging on the steam dryer are managed in accordance with the guidelines of BWRVIP-139 as approved by the NRC and accepted by the BWRVIP Executive Committee."

a. Inspection Scope

The inspectors determined the JAFNPP five bank, slanted hood, steam dryer was inspected to BWRVIP-139 and SIL-644 in 2006 and that Entergy staff plan to re-inspect this component in accordance with BWRVIP-139-A in five cycles. The inspectors reviewed implementing procedure SEP-RVI-004, Revision 1, "JAF Reactor Vessel Internals Management (RVIM) Inspection Program Plan" dated 9/5/2012. In addition the inspectors reviewed IVVI Examination Data Sheet No. JAF-R16-IVVI-10, 10/7/2004, recording the results of an examination in conformance with the guidance contained in BWRVIP-139.

b. Findings

No findings were identified.

Commitment 23 – "Enhance the BWR Vessel Internals Program to perform inspections of the core plate rim hold down bolts. Appendix A.2.2.7 Core Plate is revised to add that JAFNPP will perform one of the following:

- Install core plate wedges prior to the period of extended operation; or,
- Complete a plant-specific analysis to determine acceptance criteria for continued inspection of core plate rim hold down bolting in accordance with BWRVIP-25 and submit the inspection plan, along with the acceptance criteria and justification for the inspection plan, to the NRC two years prior to the period of extended operation for NRC review and approval.

If Option 2 is selected, the analysis to determine acceptance criteria will address the information requested in RAIs 3.1.2-2A and 4.7.3.2-1."

a. Inspection Scope

The inspectors determined Entergy staff implemented this commitment by submitting a plant specific analysis to the NRC in a letter dated September 28, 2012, supplemented by letters dated April 17, September 27, and October 3, 2013. The NRC staff concluded in a letter to Entergy dated July 23, 2014, (ML14198A152) that Entergy submitted a plant-specific analysis to determine acceptance criteria for continued inspection of the core plate rim hold-down bolts in accordance with Boiling Water Reactor (BWR) Vessel and Internals Project, BWR Core Plate Inspection and Flaw Evaluation Guidelines (BWRVIP-25). The NRC staff found that Entergy satisfactorily addressed this commitment.

Commitment 25 – “Implement the Oil-Filled Cable System aging management that will be controlled by the following programs: External Surface Monitoring Program, Oil Analysis Program, and Periodic Surveillance and Preventive Maintenance Program.”

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, NRC SER, associated implementation procedure, and discussed the status of implementation of the commitment with Entergy technical personnel. The inspectors determined Entergy implemented the oil-filled cable system aging management program which is controlled by the External Surface Monitoring Program, Oil Analysis Program, and Periodic Surveillance and Preventive Maintenance Program. The inspectors concluded that Entergy staff had performed adequate evaluations, including reviews of industry experience and plant operating history to determine appropriate aging effects. The inspectors further determined that program-level documents provided adequate guidance to ensure that the aging effects were appropriately identified and addressed.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On August 29, 2014, the inspectors presented the inspection results to Mr. Brian Sullivan, General Manager of Plant Operations, and other members of the FitzPatrick staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

B. Sullivan, General Manager of Plant Operations
M. Hawks, Regulatory Assurance Specialist
R. Locy, Project Manager
S. Hogan, Finance Manager
T. Holden, Communication
D. Lach, Senior Project Manager Nuclear
E. Riley, Project Manager
L. Coyle, Supervisor
B. Finn, Director R&PI
B. Drain, Senior Manager Site Projects and Maintenance Services
D. Scurluck, Regulatory Assurance Specialist
T. Hendy, Observer Millstone/Dominion
S. Woolf, Senior Engineer
M. Cook, Senior Engineer
A. Porch, Senior Engineer
D. Koelbel, Senior Engineer
E. Thompson, Engineer I
R. Casella, Senior Lead Engineer
C. Parker, Engineer III
B. Grabowski, Engineer III
M. Stone, Engineer I
R. Giguere, Senior Engineer

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

None.

LIST OF DOCUMENTS REVIEWED

Boiling Water Vessels Internal Project Documents
BWRVIP-03, Reactor Pressure Vessel and Internals Examination Guidelines (EPRI 105696 R12, December 2009)
BWRVIP-06-A, Safety Assessment of BWR Reactor Internals (EPRI 1006598, March 2002)
BWRVIP-14-A, Evaluation of Crack Growth in BWR Stainless Steel RPV Internals (EPRI 1016569, September 2008)
BWRVIP-16-A, Internal Core Spray Piping and Sparger Replacement Design Criteria (EPRI 1012113, September 2005)

- BWRVIP-18-A, BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines (EPRI 1011469, February 2005)
- BWRVIP-19-A, Internal Core Spray Piping and Sparger Repair Design Criteria (EPRI1012114, September 2005}
- BWRVIP-25, BWR Core Plate Inspection and Flaw Evaluation Guidelines (EPRI TR-107284, December 1996),
- BWRVIP-26-A, Top Guide Inspection and Flaw Evaluation Guidelines (EPRI 1009946, November 2004)
- BWRVIP-27-A, BWR Vessel and Internals Project, BWR Standby Liquid Control System/Core Plate LIP Inspection and Flaw Evaluation Guidelines, EPRI1007279, August 2003
- BWRVIP-38, BWR Shroud Support Inspection and Flaw Evaluation Guidelines (EPRI TR-108823, September 1997)
- BWRVIP-41 Revision 2, BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines (EPRI 1019570, July 2009)
- BWRVIP-42-A, LPCI Coupling Inspection and Flaw Evaluation Guidelines (EPRI1011470, February 2005)
- BWRVIP-44-A, Underwater Weld Repair of Nickel Alloy Reactor Vessel Internals (EPRI1014352, August 2006)
- BWRVIP-45, Weldability of Irradiated LWR Structural Components (EPRI 108707), September 1997)
- BWRVIP-47-A: BWR Vessel and Internals Project, BWR Lower Plenum Inspection and Flaw Evaluation Guidelines, EPRI Technical Report 1009947, June 2004.
- BWRVIP-48-A: BWR Vessel and Internals Project Vessel ID Attachment Weld Inspection and Flaw Evaluation Guidelines, June 2004 EPRI 1009948, TR-108724,
- BWRVIP-49-A: BWR Vessel and Internals Project, Instrument Penetration Inspection and Flaw Evaluation Guidelines, EPRI Technical Report 1006602, March 2002.
- BWRVIP-50-A, Top Guide/Core Plate Repair Design Criteria (EPRI 1012115, September 2005)
- BWRVIP-51-A, Jet Pump Repair Design Criteria (EPRI 1012116, September 2005)
- BWRVIP-52-A: BWR Vessel and Internals Project Shroud Support and Vessel Bracket Repair Design Criteria, September 2005 EPRI 1012119
- BWRVIP-53-A: BWR Vessel and Internals Project, Standby Liquid Control Line Repair Design Criteria, EPRI Technical Report 1012120, September 2005.
- BWRVIP-55-A, Lower Plenum Repair Design Criteria (EPRI 1012117, September 2005)
- BWRVIP-56-A, LPCI Coupling Repair Design Criteria (EPRI1012118, September 2005)
- BWRVIP-57-A: BWR Vessel and Internals Project, Instrument Penetration Repair Design Criteria, EPRI Technical Report 1012111, September 2005.
- BWRVIP-58-A, CRD Internal Access Weld Repair (EPRI1012618, October 2005)
- BWRVIP-59-A, Evaluation of Crack Growth in BWR Nickel-Base Austenitic Alloys in RPV Internals (EPRI1014874, May 2007)
- BWRVIP-60-A, Evaluation of Crack Growth in BWR Low Alloy Steel RPV Internals (EPRI 1008871, June 2003)
- BWRVIP-62, Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection (EPRI TR-108705, December 1998)

BWRVIP-74-A, BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guideline for License Renewal (EPRI 1008872, June 2003)
BWRVIP-76-A, BWR Core Shroud Inspection and Flaw Evaluation, Guidelines (EPRI 1019057, November 2009)
BWRVIP-86, Revision 1, Updated BWR Integrated Surveillance Program (ISP) Implementation Plan, September 2008.
BWRVIP-135, "ISP Data Source Book and Plant Evaluations", 3/31/2006
BWRVIP-86-A, Updated BWR Integrated Surveillance Program (ISP) Implementation Plan, October 2002
BWRVIP-116, July 2003, Integrated Surveillance Program (ISP) Implementation for License Renewal
BWRVIP Letter 2006-119, Clarification of Reporting Requirements for BWRVIP-135, Revision 1, "ISP Data Source Book and Plant Evaluations".
BWRVIP-135, EPRI Report 1011019, Integrated Surveillance Program (ISP) Data Source Book and Plant Evaluations. 2004.
BWRVIP-135, Revision 1, Integrated Surveillance Program (ISP) Data
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BWRVIP-138 Revision 1, Updated Jet Pump Beam Inspection and Flaw Evaluation Guidelines (EPRI 1016574, December 2008)
BWRVIP-139 Pages 2-2, 2-12, 2-13, 2-76, Steam Dryer Materials
BWRVIP-139-A, Steam Dryer Inspection and Flaw Evaluation Guidelines (EPRI TR-1018794, July 2009)
BWRVIP-180, Access Hole Cover Inspection and Flaw Evaluation Guidelines (EPRI 1013402, November 2007)
BWRVIP-181, Steam Dryer Repair Design Criteria (EPRI 1013403, November 2007)
BWRVIP-183, BWR Vessel and Internals Project, Top Guide Grid Beam Inspection and Flaw Evaluation Guidelines (EPRI 1013401, December 2007)
BWRVIP-190, BWR Water Chemistry Guidelines-2008 Revision (EPRI 1016579, October 2008)
BWRVIP-234, Thermal Aging and Neutron Embrittlement Evaluation of CASS for BWR Internals, December 2009
EPRI Letter, Chuck Wirtz to All BWRVIP Committee Members, March 16, 2009, "BWRVIP Inspection Summaries for Spring 2008 Outages"
EPRI Letter, Chuck Wirtz to All BWRVIP Committee Members, February 16, 2010, "BWRVIP Inspection Summaries for Spring 2009 Outages"
Letter From Chuck Wirtz to All BWRVIP Committee Members, March 16, 2009
Letter From Chuck Wirtz to All BWRVIP Committee Members, February 16, 2010

NRC Documents

Generic Letter 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping."
Generic Letter 88-01, Supplement 1, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping"
Generic Letter 80-095, November 13, 1980
Generic Letter 94-03, IGSCC of Core Shrouds in BWRs, July 25, 1994
NUREG-0313, Revision 2, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping."

NUREG/CR 4513, Revision 1, Estimation of Fracture Toughness of CASS during Thermal Aging in LWR Systems, May 1994
NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking", November 13, 1980
Information Notice No. 82-39: "Service Degradation of Thick Wall Stainless Steel Recirculation System Piping at a BWR Plant." September 21, 1982
Information Notice No. 84-41: "IGSCC in BWR Plants." June 1, 1984
Information Notice 4004-08: "Reactor Coolant Pressure Boundary Leakage Attributable to Propagation of Cracking in Reactor Vessel Nozzle Welds."
Information Notice 2009-26, Degradation of Neutron-Absorbing Materials in the Spent Fuel Pool, U.S. Nuclear Regulatory Commission, October 28, 2009.
Information Notice No. 94-42, Cracking in the Lower Region of the Core Shroud in BWRS, June 7, 1994
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Information Notice No. 93-101, Jet Pump Hold Down Beam Failure, December 17, 1993
Information Notice No. 97-02, Cracks Found in Jet Pump Riser Assembly Elbows at BWRs, February 6, 1997
Information Notice No. 2004-08: Reactor Coolant Pressure Boundary Leakage Attributable to Propagation of Cracking in Reactor Vessel Nozzle Welds, April 22, 2004
NRC Bulletin 80-13, Cracking in Core Spray Sparger, May 12, 1980
NRC Bulletin 80-07, BWR Jet Pump Failure, April 4, 1980
10 CFR Part 50, Appendix G, Fracture Toughness Requirements, Office of the Federal Register, National Archives and Records Administration, 2009.
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NUREG 0991 Supplement 2, Section 9.5.1.5.2, dated October 1984, "Limerick Generating Station Safety Evaluation Report - Fire Protection Water Supply System"
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Drawing

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Calculations

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11825-V-1-5VB, Vessel Calculation for #2 Fuel Oil Storage Tank, Rev. 0

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EN-DC-349, Metal Enclosed Bus Inspection Procedure, Rev. 3
 EN-DC-178, System Walkdowns, Rev. 4
 EN-DC-310, Predictive Maintenance, Rev. 5
 SEB-LUB-JAF-001, JAF Lubrication Program, Rev. 0
 EN-FAP-LR-025, Selective Leaching Inspection, Rev. 3
 SP-01.07, Diesel Fuel Oil Sampling and Analysis, Rev. 14
 EN-DC-178, System Walkdowns, Revision 7
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 MP-101.41, Sampling of Lubricants for the Plant Lube Oil Analysis Program, Revision 29
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 EN-DC-343, Underground Piping and Tanks Inspection and Monitoring Program, Revision 8
 RT-01.06, EHC, Stator Cooler Sampling and Analysis, Revision 13
 RT-01.08, Hot Water Boiler, Glycol Hot Water, and Control Room Chilled Water Sampling and Analysis, Revision 9
 SP-01.11, Unmonitored Paths Sampling and Analysis, Revision 21
 PC-01.01, Hydrogen Water Chemistry and Zinc Injection Program, Revision 10
 RT-01.02, Feedwater Condensate Sampling and Analysis, Revision 13
 RT-01.05, Makeup Demineralizer System Sampling and Analysis, Revision 19
 RT-01.07, Torus Sampling and Analysis, Revision 7
 SP-01.02, Reactor Water Sampling and Analysis, Revision 24
 SP-01.04, Standby Liquid Control Sampling and Analysis, Revision 12
 SP-01.21, Condensate Storage Tanks Sampling and Analysis, Revision 14
 SP-01.27, Residual Heat Removal Sampling and Analysis, Revision 7
 SP-01.29, Spent Fuel Pool Sampling and Analysis, Revision 9
 MST-076.11, Fire Barrier Penetration Functional Integrity Surveillance Test, Revision 19
 ST-76B, Electric Fire Pump 76P-2 Operational Check, Revision 17
 ST-76E, Quarterly Fire Hose Station Inspections, Revision 16
 ST-76F, Fire Hose Station Gasket Inspection and Hose Rerack Test, Revision 7
 ST-76FA, High Radiation Area Fire Hose Station Inspection and Rerack, Revision 4
 ST-76J4, West Cable Tunnel Smoke Detector and Sprinkler Test, Revision 18
 ST-76J5, East Cable Tunnel Smoke Detector and Sprinkler Test, Revision 16
 ST-76J24, Electric Fire Pump 76P-2 Performance Test, Revision 22
 ST-76K, Fire Header Integrity and Nozzle Inspection, Revision 8
 ST-76N, Nozzle Air Flow Test for HPCI System, Revision 8
 ST-76P, Nozzle Air Flow Test for RCIC System, Revision 7
 ST-76Q, HPCI Foam System Header Integrity and Nozzle Inspection, Revision 1
 ST-76U, Fire System Flow Test, Revision 11
 ST-76X, Nozzle Air Flow Test for Water Curtain Spray Boundaries Number 1 through 8, Revision 7
 FPP-3.5, Annual Fire Hydrant Check, Revision 8
 MST-076.09, Fire Hose Inspection and Hydrostatic Test*, Revision 12
 EN-EP-S-002-Multi, Buried Piping and Tanks General Visual Inspection, Revision 0
 ST-76Y, Fire Door Inspection and Operability Test, Revision 19
 ST-76Z, Fire Damper Inspection, Revision 20
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MP-076.16, Fire Door Maintenance, Revision 14
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JAF-RPT-14-00005, Metal Enclosed Bus Inspection Report for License Renewal Implementation, Rev. 0
JAF-RPT-09-LR017, Review of the Metal-Enclosed Bus Inspection Aging Management Program for License renewal Implementation, Rev. 0
JAF-RPT-14-00001, License Renewal Selective Leaching Aging Management Summary Report, Rev. 0
JAF-RPT-09-LR025, Review of the Selective Leaching Program for License Renewal Implementation, Rev. 05
JAF-RPT-09-LR020, Review of the Lube Oil Analysis Aging Management Program for License Renewal Implementation, Rev. 0
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Miscellaneous

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Letter, Entergy to USNRC, Entergy Nuclear Operations, Inc. James A. FitzPatrick Nuclear Power Plant, Docket No. 50-333, License No. DPR-59, License Renewal Application, Amendment 9, dated 4/6/07
13-0555-TR-001, Altran Laboratory Analysis of Three Valves for Selective Leaching, dated July 14
LTR from PCA Engineering to Aaron Environmental, PCA Job No. 32699 – Entergy Oswego Inspection, dated 11/26/13
Entergy Nuclear Fitzpatrick Oil Analysis Data Sheet Report, dated 8/7/14
Letter from NEI, Alexander Marton to USNRC, License Renewal and Environmental Impacts, Dr. P. T. Kuo, Project Number 690, dated 4/1/04
EN-LI-110-Att-9.2, Commitment Closure Verification Form (A-18348), Revision 5
EN-LI-110-Att-9.2, Commitment Closure Verification Form (A-18360), Revision 5
EN-LI-110-Att-9.2, Commitment Closure Verification Form (A-18341), Revision 5
EN-LI-110-Att-9.2, Commitment Closure Verification Form (A-18347), Revision 5
EN-LI-110-Att-9.4, Commitment Change Evaluation Form (A-18347), Revision 6
EN-LI-110-Att-9.4, Commitment Change Evaluation Form (JAF-18354), Revision 1
EN-DC-324-Att-9.1, PMCR Request Form for Essential Tasks (LR-PM, Inspect Fire System Piping), Revision 8
EN-DC-126-Att-9.2, Engineering Calculation Cover Page (EC # 44874), Revision 4

Work Orders

00307413-01	00179851-01	52286710-01
00316088-01	00288304-01	00196537-01
00311928-01	00260322-01	00144649-01
00286388-02	00265123-01	51794406-01
00286315-01	00309775-01	52287766 01
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JAF-RPT-09-LR020, Review of the Lube Oil Analysis Aging Management Program for License Renewal Implementation, dated 02/17/2010

JAF-RPT-09-LR022, Review of the Periodic Surveillance and Preventive Maintenance Aging Management Program for License Renewal Implementation, dated 04/14/2011

JAF-RPT-09-LR001, Review of the Buried Piping and Tanks Inspection Aging Management Program for License Renewal Implementation, dated 06/14/2011

JAF-RPT-09-LR291, Review of the Water Chemistry Control – Auxiliary Systems Aging Management Program for License Renewal Implementation, dated 06/03/2010

JAF-RPT-09-LR132, Review of the Fire Water System Aging Management Program for License Renewal Implementation, dated 05/13/2010

JAF-RPT-09-LR131, Review of the Fire Protection Aging Management Program for License Renewal Implementation, dated 05/13/2010

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EN-WM-105, 71T-2 Oil Filled Cables, dated 06-22-2011

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EN-WM-105, Fire Protection Piping, dated 02-03-2007

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LO-JAFLO-2013-00039
LR-LAR-2008-00048
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LIST OF ACRONYMS

ADAMS	NRCs Agencywide Document Access and Management System
10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ASME	American Society of Mechanical Engineers
BWR	Boiling Water Reactor
BWRVIP	Boiling Water Reactor Vessel Internals Program
CASS	Cast Austenitic Stainless Steel
CFR	<i>Code of Federal Regulations</i>
CRD	Control Rod Drive
CRDRL	Control Rod Drive Return Line Nozzle
CUF	Cumulative Usage
EDG	Emergency diesel Generator
ENF	Entergy Nuclear Fitzpatrick, LLC
ENO	Entergy Nuclear Operations, Inc.
F _{en}	Fatigue Life Correction Factor
GALL	Generic Aging Lessons Learned
ISI	In-service Inspection
IVVI	In-vessel Visual Inspection
JAFNPP	James A. FitzPatrick Nuclear Power Plant
LRA	License Renewal Application
NFPA	National Fire Protection Association
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
PEO	Period of extended operation
PWR	Pressurized Water Reactor
RHR	Residual Heat Removal
RIS	Regulatory Issue Summary
RVIM	Reactor Vessel Internals Management
SER	Safety Evaluation Report
SSC	System, structure, and component
UFSAR	Updated final safety analysis report
UT	Ultrasonic Test
VIP	Vessel Internals Program