

Submitted: August 10, 2015



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

July 5, 2013

Mr. John Ventosa
Site Vice President
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT 2 – NRC LICENSE RENEWAL
TEAM INSPECTION REPORT 05000247/2013009

Dear Mr. Ventosa:

On May 23, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed a team inspection at your Indian Point Nuclear Generating Unit 2. The enclosed inspection report documents the inspection results, which were discussed on May 23, 2013 with Mr. Donald Mayer and other members of your staff.

The inspectors examined activities conducted by your staff to complete commitments Entergy made as part of your application for a renewed facility operating license. The inspectors also reviewed selected procedures and records, observed activities, and interviewed personnel.

No findings were identified during this inspection. The team concluded that Entergy had made sufficient progress to complete our review of 30 commitments during this inspection. Eleven of the commitments reviewed during this inspection were determined to merit additional assessment during our planned follow-up license renewal inspection scheduled for September 2013.

In accordance with 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 Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

James M. Trapp, Chief
Engineering Branch 1
Division of Reactor Safety

Docket No. 50-247
License No. DPR-26

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450 Broadway, GSB
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DATE	7/3/13	7/3/13	7/5/13		

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J. Ventosa

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Enclosure:

Inspection Report 05000247/2013009

w/Attachment: Supplementary Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-247

License No.: DPR-26

Report No.: 05000247/2013009

Applicant: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Energy Center Unit 2

Location: 450 Broadway
Buchanan, NY 10511-0249

Dates: May 6-10 and 20-23, 2013

Inspectors: G. W. Meyer, Senior Reactor Inspector, Team Leader
E. H. Gray, Senior Reactor Inspector
W. C. Holston, Senior Mechanical Engineer
M. C. Modes, Senior Reactor Inspector
J. E. Richmond, Senior Reactor Inspector
M. P. Patel, Operations Engineer
S. K. Chaudhary, Reactor Inspector
E. M. Keighley, Project Engineer
C. H. Ng, Mechanical Engineer

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

SUMMARY OF FINDINGS

IR 05000247/2013009; 05/6/2013 - 05/23/2013; Indian Point Nuclear Generating Unit 2; License Renewal Team Inspection.

This report covers an announced two week inspection, using the guidance provided in NRC inspection procedure Temporary Instruction 2516/001, "Review of License Renewal Activities," of activities conducted by Entergy to complete commitments made to the NRC as a part of the Indian Point Energy Center, Unit 2, application for a renewed operating license. The commitments reviewed during this inspection are recorded in Supplement 1 to NUREG-1930, "Safety Evaluation Report Related to the License Renewal of Indian Point Generating Units Numbers 2 and 3," Attachment 1, dated August 2011, and in other related correspondence. The inspection also reviewed enhancements made to selected aging programs.

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

No findings were identified. On a sampling basis, the team concluded that Entergy had made sufficient progress to complete our review of 30 commitments during this inspection. Eleven of the commitments reviewed during this inspection were determined to merit additional assessment during our planned follow-up license renewal inspection scheduled for September 2013.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Review of License Renewal Activities (TI 2516/001)

.1 Background

The expiration date of the operating license for Indian Point Unit 2 is midnight on September 28, 2013. Indian Point Unit 2 meets the criteria in Title 10 of the *Code of Federal Regulations* (10 CFR) 2.109(b), "Effect of timely renewal application," and will likely operate beyond the current operating license expiration date. Due to the Commission's decision to revise the Waste Confidence Decision and Rule and because of the ongoing Atomic Safety and Licensing Board hearings, the Commission is not expected to issue a renewed license for Indian Point Unit 2 before the expiration date of the original license. Therefore, Indian Point is expected to continue operations under the timely renewal provisions of 10 CFR 2.109(b).

On May 1, 2013, Entergy sent a letter to the Nuclear Regulatory Commission (NRC) (ML13142A203) describing two actions Entergy plans to complete prior to entering the period of extended operation (PEO). The first action is that Entergy will submit a letter to the NRC confirming implementation of the Unit 2 license renewal commitments. The second Entergy action is to submit a letter to the NRC confirming that the Unit 2 Updated Final Safety Analysis Report has been updated to include the Unit 2 aging management programs making them part of the licensing basis by September 28, 2013.

The team used NRC Inspection Manual Temporary Instruction 2516/001 to conduct this inspection. The Temporary Instruction was written specifically for plants like Indian Point Unit 2, where the holders of an operating license meet the criteria of 10 CFR 2.109, for timely renewal, but a final decision by the NRC on the license renewal application is not expected prior to the period of extended operation. The inspection objectives and requirements of the Temporary Instruction are to report the status of license renewal commitment implementation, the status of aging management program implementation, and to verify the description of programs and activities for managing the effects of aging are consistent with the Updated Final Safety Analysis Report.

The NRC planned to conduct this two week announced team inspection to assess the resolution of commitments made by the applicant as part of the license renewal process. Additionally, the NRC had planned to conduct an additional limited scope one week inspection in September to address issues meriting additional follow-up based on the results of this inspection and to review any new issues or commitments.

On a sampling basis, the team concluded that Entergy had made sufficient progress to complete our review of 30 commitments during this inspection. Eleven of the commitments reviewed during this inspection were determined to merit additional assessment during our planned follow-up inspection scheduled for September 2013.

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The NRC review of four commitments (28, 29, 34 and 36) is documented in NRC Inspection Report 05000247/2012008 (ML12110A315). Three commitments (11, 32, and 39), listed in the Safety Evaluation Report, were determined not to be applicable to Unit 2 and were not reviewed during this inspection.

Sample Selection Process

Temporary Instruction 2516/001 requires that the inspectors select a sample of completed commitments, license conditions, and aging management programs for review during the inspection. The reviewed commitments and enhanced aging management programs were selected based on several attributes including: risk significance; 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 or aging management program.

The commitments reviewed during this inspection are recorded in Supplement 1 to NUREG-1930, "Safety Evaluation Report Related to the License Renewal of Indian Point Generating Units Numbers 2 and 3," Attachment 1, dated August 2011, Entergy letter to the NRC (NL-12-174), dated November 29, 2012 (ML12341A180) and in other related correspondence. For each commitment selected for review, the inspectors reviewed supporting documents including completed surveillances, conducted interviews, performed visual inspection of structures and components, and observed selected activities described below to verify the licensee completed the necessary actions to comply with the commitments.

The inspectors selectively verified the licensee implemented the aging management programs, included in the staff's license renewal safety evaluation report, in accordance with 10 CFR Part 54, "Requirements for the Renewal of Operating Licenses for Nuclear Power Plants." The inspectors verified a selected sample of licensee corrective actions that were the result of license renewal activities.

The following commitments and enhanced programs were reviewed:

.2 Commitment Reviews

- .2.1 Commitment 1: Enhance the Aboveground Steel Tanks Program to perform thickness measurements of the bottom surfaces of the condensate storage tanks, city water tank, and fire water tanks once during the first 10 years of the period of extended operation. Enhance the Aboveground Steel Tanks Program for Indian Point Unit 2 (IP2) and Indian Point Unit 3 (IP3) to require trending of thickness measurements when material loss is detected.

a. Inspection Scope

The inspectors observed the external conditions of each of the aboveground tanks in the license renewal scope during a plant walk down. Entergy had scheduled procedures and activities to measure the tank bottom thickness and trend thickness changes

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indicative of degradation. The inspectors reviewed the planned, periodic visual examinations under EN-DC-178, System Walkdowns, and 2-PI-SA002, Atmospheric Tanks, External Inspection, for the aboveground water storage tanks. The inspectors noted that documentation of the condition of coating integrity of external storage tank walls was specified in EN-DC- 178, but was not addressed in 2-PI-SA002. Condition Report (CR) CR-IP2-2013-01989 was issued to update procedure 2-PI-SA002 regarding the condition of coatings.

Findings and Observations

No findings were identified.

- .2.2 Commitment 2: Enhance the Bolting Integrity Program to clarify that actual yield strength is used in selecting materials for low susceptibility to stress crack corrosion (SCC) and clarify the prohibition on use of lubricants containing MoS₂ for bolting. The Bolting Integrity Program manages loss of preload and loss of material for all external bolting.

a. Inspection Scope

In NRC Inspection Report 05000247/2012008, the inspectors reviewed the implementation of the Bolting Integrity Program, but noted that a general statement on loss of preload and loss of material for external bolting in the commitment had not been included in the site procedure. The inspectors reviewed the Entergy corporate procedure for torqueing applications that had superseded the site procedure previously reviewed. The corporate procedure included statements which addressed the general statement on external bolting.

Findings and Observations

No findings were identified.

- .2.3 Commitment 3: Implement the Buried Piping and Tanks Inspection Program as described in License Renewal Application (LRA) Section B.1.6. Risk assess buried in-scope pipe segments and tanks based on the impact of leakage and conditions affecting the risk for corrosion; classify the pipe segments and tanks as having a high, medium, or low impact of leakage; establish inspection priority and frequency based on the results of the risk assessment; and perform inspections using inspection techniques with demonstrated effectiveness.

a. Inspection Scope

The inspectors conducted a walk down of an excavation which exposed three in-scope segments of buried piping. Piping coatings were generally in good condition. The inspectors confirmed that the corporate procedures included criteria for assessing buried in-scope piping segments and tanks based on the impact of leakage and conditions affecting risk for corrosion. The inspectors also confirmed that the site procedure, SEP-UIP-IPEC, Underground Components Inspection Plan, Appendix A, Piping

Enclosure

Inspection Information, and Appendix B, Tank Inspection Information, contained a listing of in-scope piping segments and tanks, each classified as high, medium, or low based on the impact of leakage. Further, the inspectors reviewed 20 inspection reports, which Entergy had stated would be completed prior to the period of extended operation. The inspection technique was excavated direct visual examinations with subsequent ultrasonic thickness measurements where coating degradation was noted. The inspections consisted of an acceptable mix of opportunistic and planned inspections with the majority conducted on piping segments classified as high risk. All of the inspections provided valued insights into the condition of coatings and backfill quality. Ultrasonic thickness measurements in locations of coating degradation demonstrated that minimal or no corrosion of the base metal had occurred.

Findings and Observations

No findings were identified.

- .2.4 Commitment 4: Enhance the Diesel Fuel Monitoring Program to include cleaning and inspection of additional fuel oil tanks, include quarterly sampling and analysis of additional tanks, include periodic thickness measurements with acceptance criteria of the bottom surfaces of in-scope fuel oil tanks, change the analysis for water and particulates to a quarterly frequency for some tanks, and address water removal and biocide treatment.

- a. Inspection Scope

The inspectors reviewed the commitment implementation plan, and program and implementing procedures, and discussed this commitment with applicable plant staff. The Diesel Fuel Monitoring Program is an existing program that was enhanced to meet the commitments. The inspectors reviewed revised diesel fuel handling procedures, diesel fuel sampling procedures, and chemical addition procedures. Also, the inspectors reviewed inspection records for the No. 2 fuel oil storage tank, and work orders for cleaning and inspecting additional tanks.

Findings and Observations

No findings were identified.

- .2.5 Commitment 5: Enhance the External Surfaces Monitoring Program to include periodic inspections of systems in scope and subject to aging management review for license renewal in accordance with 10 CFR 54.4(a)(1) and (a)(3). Inspections shall include areas surrounding the subject systems to identify hazards to those systems. Inspections of nearby systems that could impact the subject systems will include structure, systems, and components (SSC) that are in scope and subject to aging management review for license renewal in accordance with 10 CFR 54.4(a)(2).

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and program procedures, and discussed this commitment with applicable plant staff and license renewal personnel. The inspector noted that EN-DC-178, System Walkdowns, Revision 5 addressed the enhanced inspection scope during walkdowns to include attention extended to nearby systems that could present a hazard or affect the walked down system. The inspectors reviewed the site Engineering Standard ENN-MS-S-004-IPEC, which documented the system categories and their corresponding level of inspection, including direction to accomplish the enhanced scope of system walkdown and the surrounding areas. The inspectors noted that the city water tank category classification in Attachment 7.1 of ENN-MS-S-004-IPEC was not consistent between Unit 2 and Unit 3. Entergy issued Condition Report CR-IP2-2013-01756 to correct this and improved the classification in Revision 2 of ENN-MS-S-004-IPEC.

Findings and Observations

No findings were identified.

- .2.6 Commitment 6: Enhance the Fatigue Monitoring Program to monitor steady state cycles and feedwater cycles or perform an evaluation to determine monitoring is not required. Review the number of allowed events and resolve discrepancies between reference documents and monitoring procedures.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and discussed this commitment with applicable plant staff and license renewal personnel. The inspectors noted that Entergy had awarded contracts to perform the calculations that will determine whether monitoring of steady state cycles and feedwater cycles is required. Entergy expected that the calculations would be completed prior to the period of extended operation. The inspectors also noted that Entergy planned to revise procedure 2-PT-2Y015, Thermal Cycle Monitoring Program, if the calculations demonstrate that a change in the number of allowable steady state cycles and feedwater cycles is identified.

Findings and Observations

No findings were identified; however, the inspectors determined that additional inspection was merited, including review of the results of the calculations and any changes to the Thermal Cycle Monitoring Program procedure.

- .2.7 Commitment 7: Enhance the Fire Protection Program to explicitly state that the diesel fire pump engine sub-systems (including the fuel supply line) shall be observed while the pump is running. Acceptance criteria will be revised to verify that the diesel engine does not exhibit signs of degradation while running; such as fuel oil, lube oil, coolant, or exhaust gas leakage. Enhance the Fire Protection Program to specify that the diesel fire pump engine carbon steel exhaust components are inspected for evidence of corrosion and cracking at least once each operating cycle.

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a. Inspection Scope

The inspectors reviewed the diesel fire pump testing and maintenance procedures to verify that the surveillance and maintenance procedures had been revised to include the enhanced visual inspections, and had appropriate acceptance criteria for those inspections. The inspectors walked down the diesel fire pump to independently assess material conditions of the fire pump and diesel engine, and the feasibility of the revised procedures.

Findings and Observations

No findings were identified.

- .2.8 Commitment 8: Enhance the Fire Water Program to include inspection of hose reels for evidence of corrosion, replace all or test a sample of sprinkler heads, to perform wall thickness evaluations of fire protection piping, and inspect the internal surfaces of foam-based fire suppression tanks.

a. Inspection Scope

The inspectors reviewed the fire hose reel inspection procedures to verify that the procedures had been revised to include the enhanced visual inspections, and had appropriate acceptance criteria for those inspections. The inspectors walked down a sample of hose reels in safety-related areas to evaluate the material condition of the hose reels.

The inspectors reviewed work orders to replace all of the fire water system sprinkler heads required for 10 CFR 50.48 prior to 50 years in service. The inspectors walked down a sample of sprinkler heads in safety-related areas to independently assess the material condition of the sprinkler heads.

The inspectors reviewed IP-RPT-12-LRD02, Fire Water Piping Wall Thickness Evaluation, the ultrasonic test (UT) examination data records, and the associated structural assessments of minimum wall thickness and corrosion rate determinations. The inspectors compared the UT data results to the established minimum wall thickness criteria for the selected piping locations to verify adequate pressure boundary and structural integrity of the fire water piping system. The inspectors also evaluated Entergy's determination that all UT test locations would be greater than the minimum required wall thickness values at the end of the period of extended operation, based upon worst case test results and conservative estimates of corrosion rates.

In addition, the inspectors evaluated the locations Entergy selected for UT examination of fire water piping to verify the locations were sufficiently diverse and represented an adequate sample population to ensure the test results were indicative of the piping system as a whole. The inspectors walked down all UT test locations and other portions of the fire water system to independently assess the material condition of the fire water piping.

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The inspectors reviewed work orders to visually inspect the internal surfaces of foam based fire suppression tanks for signs of significant corrosion. The inspectors walked down the four foam tanks to independently assess the material condition of the tanks. In addition, the inspectors reviewed the visual inspection results for opportunistic internal inspections of two of the four tanks which had been performed in 2001 and 2008.

Findings and Observations

No findings were identified.

- .2.9 Commitment 9: Enhance the Flux Thimble Tube Inspection Program to implement comparisons to wear rates identified in WCAP-12866, perform evaluations regarding changes to test frequency and scope, specify the acceptance criteria as outlined in WCAP-12866 or other plant-specific values based on evaluation of previous test results, and perform corrective actions based on tubes that exceed or are projected to exceed the acceptance criteria.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, revised inspection procedures, and discussed this commitment with applicable plant staff and license renewal personnel. An inspection procedure had been developed using the inspection results and methodology provided in WCAP-12866 and included wear rate comparisons, appropriate acceptance criteria, and corrective actions for exceeding the acceptance criteria. The inspectors reviewed the eddy current test (ECT) reports for the flux thimble tube inspections conducted at Unit 2 in March 2012 and completed at Unit 3 during the 2009 and 2011 outages. The ECT reports indicated insignificant flux thimble tube degradation. The ECT reinspections were planned in 8 years and had been included in the plant scheduling process.

Findings and Observations

No findings were identified.

- .2.10 Commitment 10: Enhance the Heat Exchanger Monitoring Program to include 22 specific heat exchangers within the program scope and provide program inspections, including non-destructive inspection methods, considerations for sampling, and acceptance criteria.

a. Inspection Scope

The inspectors reviewed corporate and site procedures, heat exchanger program database, and work order planning documents that addressed inspection, sampling, and acceptance criteria. The inspectors verified that the additional heat exchangers had been added to the program and the inspection methods, sampling and acceptance criteria were reasonable and in accordance with the commitment.

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Findings and Observations

No findings were identified.

- .2.11 Commitment 12: Enhance the Masonry Wall Program to specify that the IP1 intake structure is included in the program.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and revised procedures, and discussed this commitment with applicable plant staff and license renewal personnel. The inspectors verified that Entergy had revised EN-DC-150, Structural Monitoring Program, Attachment 9.15, in Revision 4 to explicitly include the masonry walls/structures in the intake structure of Unit 1.

Findings and Observations

No findings were identified.

- .2.12 Commitment 13: Enhance the Metal-Enclosed Bus (MEB) Inspection Program to add a 480V bus, visually inspect the external surface of MEB enclosure assemblies, include acceptance criteria, inspect bolted connections, and remove reference to “re-torquing” connections from the applicable site procedure.

a. Inspection Scope

The inspectors reviewed the licensee implementation plan and the associated completed work orders. The inspectors discussed this commitment with applicable plant staff and license renewal personnel. The inspectors reviewed the procedures associated with the MEB Inspection Program to manage the aging effects on electrical bus and bus connections, bus enclosure assemblies, and the bus insulation and insulators with non-segregated phase bus. The inspectors reviewed procedures to verify that the bus enclosure assemblies are inspected for cracks, corrosion, foreign debris, excessive dust buildup, and evidence of water intrusion. The inspectors reviewed drawings, reviewed completed work orders, and performed walkdown inspections to evaluate the capability of the program to manage aging effects.

The inspectors identified that Entergy had not included all accessible portions of the MEB within the scope of the maintenance inspection program, in that the sections of the emergency diesel generator (EDG) 480 volt MEB in the electrical tunnel had not been visually inspected and was not included in the scope of the maintenance procedure which performed the MEB inspections and tests. The inspectors noted that quantitative measures, such as insulation resistance and connection resistance tests, had been performed for the associated bus duct sections. Entergy initiated CR-IP2-2013-01786 to revise site procedures and conduct visual inspections of those additional sections of the bus ducts prior to the PEO.

Findings and Observations

No findings were identified; however, the inspectors determined that additional inspection was merited regarding the revised visual inspection procedures and results of the inspection.

- .2.13 Commitment 14: Implement the Non Environmentally Qualified (EQ) Bolted Cable Connections Program as described in LRA Section B.1.22.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and the associated completed work orders. The Non-EQ Bolted Cable Connections Program is a new program credited with managing the aging effects in bolted cable connections by a one-time inspection of a representative sample of in-scope connections. The inspectors reviewed the results of the sample of in-scope connections along with visual inspection and testing methods to assess the program and its capability to manage aging effects. The inspectors noted that there was no evidence of visual degradation, loosening, discoloration, cracking or corrosion for any of the connections in the sample population and all as-found connection resistance values were within the acceptance criteria. The results indicated that there was no loosening of bolted electrical cable connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, or oxidation. Inspectors noted that thermography was performed periodically through the preventive and predictive maintenance programs. Though loosening of bolted connection was not expected, this practice along with the condition reporting system was expected to identify any adverse trends that could develop.

Findings and Observations

No findings were identified.

- .2.14 Commitment 15: Implement Non-EQ Inaccessible Medium-Voltage Cable Program as described in LRA Section B.1.23. This new program will be implemented consistent with the corresponding program described in NUREG-1801, Section XI.E3, Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, program procedures, and cable testing procedures. The inspectors reviewed the test results associated with in-scope medium-voltage cables and low-voltage power cables to provide an indication of the condition of the conductor insulation, and associated corrective action documents. The inspectors also sampled twelve completed work orders from the inspection program that includes inspections for water accumulation in manholes at least once every year.

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Findings and Observations

No findings were identified.

- .2.15 Commitment 16: Implement the Non-EQ Instrumentation Circuits Test Review Program as described in LRA Section B.1.24. This new program will be implemented consistent with the corresponding program described in NUREG-1801, Section XI.E2, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.

a. Inspection Scope

The inspectors reviewed the test results of neutron flux monitoring instrumentation cables, interviewed plant personnel, and reviewed program documentation to assess the capability of the program to manage aging effects. The inspectors noted that the initial reviews of calibration test results for high range-radiation monitoring cables were not yet performed. However, the reviews were ongoing and were planned to be completed prior the period of extended operation. The inspectors reviewed the preventive maintenance task performing the periodic review of the cable system testing and the calibration surveillance results of neutron flux and radiation monitoring cables. The inspectors also reviewed the test methodology and procedures to determine appropriate acceptance criteria were included.

Findings and Observations

No findings were identified.

- .2.16 Commitment 17: Implement the Non-EQ Insulated Cables and Connections Program as described in LRA Section B.1.25. This new program will be implemented consistent with the corresponding program described in NUREG-1801, Section XI.E1, Electrical Cables and Connections not Subject to 10 CFR 50.49 Environmental Qualification Requirements.

a. Inspection Scope

The program manages the aging effects of cables and connections exposed to adverse localized environments by visually inspecting accessible insulated cables and connections. The inspectors reviewed Entergy's inspection results, documented in IP-RPT-10-LRD15, Cable and Connection Inspection Summary Report, a representative sample of walkdown data sheets (e.g., field observation notes), and selected CRs which had been initiated as a result of the walkdowns to evaluate and correct potential deficiencies. In addition, the inspectors walked down cables and connections in the electrical cable tunnel to independently assess the material conditions and to validate Entergy's observations.

Findings and Observations

No findings were identified.

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- .2.17 Commitment 18: Enhance the Oil Analysis Program to include the IP2 SBO/Appendix R, diesel generator, generator seal oil and turbine hydraulic control oil, formalize preliminary oil screening for water and particulates and laboratory analyses, and formalize trending of preliminary oil screening results.

a. Inspection Scope

The inspectors reviewed Entergy's corporate and Indian Point site specific procedures for the oil analysis program. The oil analysis program is an existing program that maintains oil systems free of contaminants to preserve an environment that is not conducive to loss of material, cracking, or fouling. As part of the license renewal application this process was formalized through the new procedures and a trending program, which was planned to be fully implemented by the period of extended operation. Also, the inspectors reviewed the corrective action documents from the past 5 years associated with oil analysis sampling.

The inspectors noted that SEP-LUB-IPC-002, IPEC Oil Analysis Program, Revision 0 addressed the equipment included in the preliminary oil screening for water and particulates, but was not clear regarding the boiler feed pump being scoped into the program. Based on this observation, Entergy revised the procedure to address the inspectors' concern. The inspectors reviewed Revision 1 of the procedure which included clear, specific guidance, and resolved the concern.

Findings and Observations

No findings were identified.

- .2.18 Commitment 19: Implement the One-Time Inspection Program as described in LRA Section B.1.27. This new program will be implemented consistent with the corresponding program described in NUREG-1801, Section XIM32, One-Time Inspection.

a. Inspection Scope

The inspectors reviewed Entergy's corporate procedure for one-time inspections and discussed this commitment with applicable plant staff and license renewal personnel. The intent of the One-Time Inspection Program is to confirm that other existing aging management programs have been effective. The program also performs one-time inspections of other specific components. The inspectors reviewed the Entergy letter submitting Amendment 13 to the LRA, which revised the sampling plan to the sampling specified in NUREG 1801, Generic Aging Lessons Learned (GALL), Revision 2, and the inspection tracking matrix, which implemented the revised sampling plan. The inspectors noted that the program involved over 400 inspections, approximately 300 inspections to cover the existing aging management programs for water chemistry, fuel oil, and lubrication oil, and an additional 120 inspections on components specified in the LRA. Entergy had completed slightly over half of the planned inspections. The inspectors selected 20 inspections and reviewed the inspection records.

Findings and Observations

No findings were identified; however, the inspectors determined that additional NRC inspection was merited to review the inspections remaining; any further actions needed, and program conclusions.

- .2.19 Commitment 20: Enhance the One Time Inspection Program – Small Bore Piping Program as described in LRA Section B.1.28. This new program will be implemented consistent with the corresponding program described in NUREG-1801, Section XI.M35, One-Time Inspection of American Society of Mechanical Engineers (ASME) Code Class I Small Bore Piping.

a. Inspection Scope

The program includes butt-welded piping less than 4-inch nominal pipe size that are susceptible to cracking. Samples are selected based on susceptibility to thermal stratification or turbulent penetration as provided in Electric Power Research Institute (EPRI) Report 1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)," January 2001. The program is intended to determine if the aging effect of stress induced corrosion cracking is occurring in small bore piping when the license renewal applicant has not found this aging affect in larger diameter piping.

Entergy had previously implemented a risk-informed inservice inspection program that included 195 risk-significant small bore butt welds in addition to the larger diameter butt welds chosen in the context of ASME Section XI. In order to strictly meet the commitment requirement to implement a program consistent with NUREG-1801, Section XI.M35, One-Time Inspection of ASME Code Class 1 Small Bore Piping, Entergy selected six small bore butt welds, or approximately 3 percent, from the risk-significant population of 195 which conformed with the guidance in EPRI Report 1000701, Interim Thermal Fatigue Management Guideline (MRP-24).

Findings and Observations

No findings were identified.

- .2.20 Commitment 21: Enhance the Periodic Surveillance and Preventive Maintenance Program as necessary to assure that the effects of aging will be managed such that applicable components will continue to perform their intended functions consistent with the current licensing basis through the period of extended operation.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan, work orders, and program procedures, and discussed this commitment with applicable plant staff. The program involves repetitive tasks and routine monitoring of plant operations through visual and other non-destructive examination (NDE) inspection techniques. The inspectors reviewed sampled work orders for preventive maintenance work performed on five systems.

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Findings and Observations

No findings were identified.

- .2.21 Commitment 22: Enhance the Reactor Vessel Surveillance Program revising the specimen capsule withdrawal schedules to draw and test a standby capsule to cover the peak reactor vessel fluence expected through the end of the period of extended operation. Enhance the Reactor Vessel Surveillance Program to require that tested and untested specimens from all capsules pulled from the reactor vessel are maintained in storage.

a. Inspection Scope

Entergy determined the peak reactor vessel fluence expected through the end of the period of extended operation. The inspectors reviewed the revised pressure-thermal curves generated to account for the peak reactor vessel fluence. The inspectors reviewed the supporting analysis reported in Westinghouse WCAP-16752-NP, Revision 0, Indian Point Heatup and Cooldown Limit Curves for Normal Operation, January 2008. The inspectors noted the reactor vessel beltline materials included by Entergy in the original application did not include all the components meeting the threshold of greater than 1×10^{17} n/cm². This was corrected in subsequent correspondence with the NRC. Entergy took action to document the specific components included in the beltline analysis. Entergy had issued LO-LAR-2011-0174 CA 15 to identify capsule withdrawal schedules, and require tested and untested specimens from all capsules pulled from the reactor vessel are maintained in storage.

Findings and Observations

No findings were identified.

- .2.22 Commitment 23: Implement the Selective Leaching Program as described in LRA Section B.1.33. This new program will be implemented consistent with the corresponding program described in NUREG-1801, Section XIM33 Selective Leaching of Materials.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and Entergy corporate procedure for selective leaching inspections, and discussed this commitment with license renewal personnel. The program is intended to confirm whether selective leaching, the removal of constituents from susceptible materials, is occurring. The inspectors reviewed Entergy's letter submitting Amendment 13 to the LRA, which revised the sampling plan to the sampling specified in GALL, Revision 2, and the inspection tracking matrix, which implemented the revised sampling plan. The inspectors noted that the program involved over 60 inspections, which Entergy was in progress of completing. The inspectors observed the in-plant inspections and material conditions associated with fire protection valves 698 and 699. The inspectors selected

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10 inspections of copper alloy materials and 12 inspections of gray cast iron materials, and reviewed the inspection records.

Findings and Observations

No findings were identified; however, the inspectors determined that additional NRC inspection was merited to review the inspections remaining, any further actions needed, and program conclusions.

- .2.23 Commitment 24: Enhance the Steam Generator Integrity Program to require that the results of the condition monitoring assessment are compared to the operational assessment performed for the prior operating cycle with differences evaluated.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and program procedures, and discussed this commitment with applicable plant staff. The inspectors noted that the IP2 Steam Generator Program, SEP-SG-IP2/3-001, Revision 0, in paragraph 5.3, provided for a comparison of the current condition monitoring assessment to the operational assessment performed for the prior operating cycle with an evaluation of the differences. The inspectors reviewed Entergy's corporate procedure EN-DC-317, Steam Generator Program, Revision 7, noting its inclusion of the appropriate Nuclear Energy Institute (NEI), EPRI, ASME and NRC references.

Findings and Observations

No findings were identified.

- .2.24 Commitment 25: Enhance the Structural Monitoring Program by including additional structures, inspection of structural commodities and anchors, inspection of inaccessible concrete areas, inspection of elastomers, engineering evaluation of groundwater chemistry including tritium, inspection of submerged concrete and components of intake structure, increased inspection frequency of degraded areas of water control structures, and more detailed acceptance criteria.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and revised procedures, and discussed this commitment with applicable plant staff and license renewal personnel. The inspectors reviewed the IPEC-specific attachments to the corporate procedure EN-DC-150, Structural Monitoring Program, documenting the enhancements. The inspectors verified that Entergy had revised applicable corporate and plant procedures to include the additional structures, commodities, materials, and components within the Structural Monitoring Program. Additionally, the procedure had increased the frequency of inspection of degraded areas of submerged concrete structures to every 3 years.

Findings and Observations

No findings were identified.

- .2.25 Commitment 26: Implement the Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) Program as described in LRA Section B.1.37. This new program will be implemented consistent with the corresponding program described in NUREG 1801, Section XI.M12, Thermal Aging Embrittlement of Cast Austenitic Stainless Steel Program.

a. Inspection Scope

The Thermal Aging Embrittlement of the CASS Program is a new program that manages the aging effects of loss of fracture toughness due to thermal aging of cast austenitic stainless steel components for the reactor coolant system (excluding the reactor vessel internals). Prior to the period of extended operation the program will screen all cast austenitic stainless steel components to determine which are potentially susceptible to a loss of fracture toughness. These components will be further evaluated, using a refined analytical technique, to determine the components susceptibility to reduction in fracture toughness. Entergy maintains the option of performing a volumetric examination that conforms to ASME Section XI, Appendix VIII, Supplement 10. This supplement has been in the course of preparation since Appendix VIII was first added to Section XI because extensive research has not resulted in a meaningful volumetric examination technique to date. The inspectors verified that Entergy was gathering information about component temperature and loads in order to determine the component susceptibility.

In the LRA Entergy stated that this new program will be implemented consistent with the corresponding program described in NUREG-1801, Section XI.M12, Thermal Aging Embrittlement of CASS Program. Entergy has chosen to perform a unique fracture mechanics analysis of these components, which was in progress. The inspector noted that there may be a question regarding the submittal of the analysis under ASME requirements, as stipulated in 10 CFR 50.55a.

Findings and Observations

No findings were identified; however, the inspectors determined that additional inspection was merited regarding the analysis results and the compliance approach implemented.

- .2.26 Commitment 27: Implement the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program as described in LRA Section B.1.38. This new program will be implemented consistent with the corresponding program described in NUREG-1801, Section XI.M13, Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel program.

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a. Inspection Scope

The inspectors reviewed the plans for implementation of this commitment. The programs supporting the identified actions were in the early stage of implementation. For example, the screening criteria of EPRI Technical Report 1013234, Materials Reliability Program: Screening Categorization, and Ranking of Reactor Internals Components for Westinghouse and Combustion Engineering PWR Design, (MRP-191), listed in Table 3-5, were applied to the Indian Point components listed in Table 5-1 of EPRI Report 1022863, Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227-A). However, a site document had yet to be developed that defined and implemented this program.

Findings and Observations

No findings were identified; however, the inspectors determined that additional inspection was merited regarding analysis conclusions and program direction.

- .2.27 Commitment 30: For aging management of the reactor vessel internals, IPEC will (1) participate in the industry programs for investigating and managing aging effect on reactor internals, (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval.

a. Inspection Scope

The inspectors reviewed Amendment 9 to the license renewal application, transmitted by Entergy letter NL-10-063 on July 14, 2010, which modified the application to include an aging management program for reactor vessels internals based on industry group generated guidance. This amendment included an aging management review of the reactor vessel internals within the scope of the renewal rule. The aging management program was included in the reactor vessel internals program already being implemented at Indian Point Unit 2.

Findings and Observations

No findings were identified.

- .2.28 Commitment 31: Additional P-T Curves will be submitted as required per 10 CFR Part 50, Appendix G, prior to the period of extended operation as part of the Reactor Vessel Surveillance Program.

a. Inspection Scope

Entergy submitted changes to the Indian Point 2 Technical Specifications proposing changes to the IP2 vessel heat-up and cool-down curves (P-T Curves) and low temperature over pressure requirements in letter NL-13-001, dated February 6, 2013.

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Findings and Observations

No findings were identified.

- .2.29 Commitment 33: For the locations identified in LRA Table 4.3-13 (IP2), update the fatigue usage calculations using refined fatigue analyses to determine if Cumulative Usage Factors (CUF) remain less than 1.0 when accounting for the effects of reactor water environment, using valid Fen factors.

a. Inspection Scope

The inspectors reviewed the calculations and discussed this commitment with applicable plant staff. The inspectors noted that the implementation schedule for completing the calculations was September 28, 2011. By letter dated August 9, 2010, Entergy issued Letter NL-10-082 (ML102300504) informing the NRC staff that the calculations had been completed. These calculations are documented as WCAP 17149-P, Evaluation of Pressurizer Insurge/Outsurge Transients for Indian Point Unit 2, and WCAP 17199-P, Environmental Fatigue Evaluation for Indian Point Unit 2. The inspectors reviewed these calculations and noted that both concluded that cumulative fatigue usage factors including reactor water environment effects were below the ASME Code allowable value of 1.0 for transients postulated for 60 years of operation. The inspectors noted that Entergy's action plan included revising the Thermal Cycle Monitoring Program procedure to reflect changes in the number of projected cycles used in WCAP 17199-P.

Findings and Observations

No findings were identified; however, the inspectors determined that additional inspection was merited regarding any changes to the Thermal Cycle Monitoring Program procedure warranted to ensure that it appropriately reflects the input values used by WCAP 17199-P.

- .2.30 Commitment 35: Perform a one-time inspection of representative sample area of IP2 containment liner affected by the 1973 event behind the insulation, prior to entering the period of extended period of operation, to assure liner degradation is not occurring in this area. Any degradation will be evaluated for updating of the containment liner analyses as needed.

a. Inspection Scope

The inspectors reviewed the Unit 2 one time inspection report, including visual and ultrasonic examinations, which was completed on March 22, 2012 (Work Order 00282078-01). These examinations were at the 68 foot elevation location between columns 10 and 9. The report showed that there had not been liner degradation.

Findings and Observations

No findings were identified.

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- .2.31 Commitment 37: Enhance the Containment Inservice Inspection (CIIWL) Program to include inspections of the containment using enhanced characterization of degradation (i.e., quantifying the dimensions of noted indications through the use of optical aids) during the period of extended operation. The enhancement includes obtaining critical dimensional data of degradation where possible through direct measurement or the use of scaling technologies for photographs, and the use of consistent vantage points for visual inspections.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and discussed this commitment with applicable plant staff and license renewal personnel. Reactor containment is a seismic Class I, reinforced structure, with a welded steel liner attached to the inside surface of the concrete shell. For IP2 the steel liner is covered by polyvinyl chloride insulation in a stainless steel jacket. The liner is anchored to the concrete shell by stud anchors. In accordance with applicable guidance in ASTM C33-90, Figure 1, IP2 is located in a severe weathering region and the containment concrete exterior surface should be monitored for degradation based on freeze-thaw aging. Entergy inspections have reported spalling on the containment vertical exterior wall; Entergy attributes this degradation to Cadweld concrete coverage and not to freeze-thaw aging. This spalling was the subject of an Open Item (3.0.3.3.2-1) in Safety Evaluation Report NUREG 1930, Volume 2, "Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Station Unit Nos. 2 and 3" (ADAMS ML093170671). The staff position in the Safety Evaluation is that ASME IWL inspections performed in 2005 and 2009 using enhanced visual aids showed little additional degradation since the original detection of spalling in 2000. Because Entergy demonstrated the concrete is above the 3000 psi design minimum, and Entergy is committed to implementing ASME IWL for the duration of the extended period of operation, the staff concluded the spalling is not the consequence of freeze-thaw and if it were to occur it would be captured under the provisions of an inspection program in compliance with ASME IWL.

By letter dated August 14, 2008, Entergy added Commitment 37 to enhance the Containment Inservice Inspection Program to include inspection using enhanced characterization of degradation during the period of extended operation. The enhancement includes obtaining critical dimensional data of degradation where possible through direct measurement or the use of scaling technologies for photography.

To verify that enhancements had been incorporated in the structural monitoring program, the inspectors reviewed revised program procedure EN-DC-1 that included obtaining critical dimensional data of degradation where possible through direct measurement or the use of scaling technologies for photography.

The inspectors determined that the concrete inspection of structural members was covered by the comprehensive structural monitoring program. Also, other documents, (i.e. the IWL ISI inspection packages for inspection years 2005 and 2009) were reviewed and compared to verify inclusion of enhanced examination requirements.

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Additionally, inspectors performed a walk-through inspection of accessible and exposed outer surfaces of the containment structure to assess the surface condition and any evidence of concrete distress or deterioration, such as defoliation, spalling, structurally significant cracks, and any indication of chemical reaction or attack (e.g., alkali-silica reaction).

The inspectors noted that the acceptance criteria for visual indications of concrete were included in the procedure only by reference to the American Concrete Institute (ACI) standard. This approach could introduce error and uncertainty into the inspection process compared to acceptance criteria being readily available in the procedure. Entergy issued CR-IP2-2013-02005 to enhance the procedure.

Findings and Observations

No findings were identified.

- .2.32 Commitment 38: For Reactor Vessel Fluence, should future core loading patterns, invalidate the basis for the projected values of RTpts or CvUSE, updated calculations will be provided to the NRC.

a. Inspection Scope

Entergy has calculated the charpy upper-shelf energy (CvUSE) threshold of 1×10^{17} n/cm² will be exceeded for a number of reactor vessel components at IP2. The inspectors reviewed a list of these components in Table 4 in Attachment 1 to Entergy letter NL-08-143, dated September 24, 2008. As stated in the LRA, Section 4.2.1, the 48 effective full power year, end-of-life, peak fluence for IP2 was calculated to be 1.906×10^{19} n/cm². As a consequence of this analysis Entergy has implemented flux reduction measures. In corrective action LO-LAR-2011-0174 CA 29, Entergy initiated development of a site specific program document to maintain the flux mitigation program during the extended period of operation.

Findings and Observations

No findings were identified.

- .2.33 Commitment 40: Evaluate plant specific and appropriate industry operating experience and incorporate lessons learned in establishing appropriate monitoring and inspection frequencies to assess aging effects for the new aging management programs. Documentation of the operating experience evaluated for each new program will be available on site for NRC review prior to the period of extended operation.

a. Inspection Scope

Entergy stated that the evaluations to implement this commitment would be performed following the implementation of the new programs. As such there was insufficient material to review during the inspection.

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Findings and Observations

No findings were identified; however, the inspectors determined that additional inspection was merited regarding review of the evaluations.

- .2.34 Commitment 41: IPEC will inspect steam generators for both units to assess the condition of the divider plate assembly. The examination technique used will be capable of detecting primary water stress crack corrosion (PWSCC) in the steam generator divider plate assembly. The IP2 steam generator divider plate inspections will be completed within the first ten years of the period of extended operation. The IP3 steam generator divider plate inspections will be completed within the first refueling outage (RFO) following the beginning of the period of extended operation.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and discussed this commitment with informed plant staff. Entergy personnel stated that preparations for these steam generator inspections are in-progress (the earliest inspection would occur in 2016). As evidence of preparations for this inspection, Entergy provided an EPRI report on divider plate cracking presented in June 5-7, 2012, and EPRI Technical Report 3002000411, dated April 2013 on the Flaw Tolerance Evaluation of the Steam Generator Channel Head, which related to the inspections.

Findings and Observations

No findings were identified.

- .2.35 Commitment 42: IPEC will develop a plan for each unit to address the potential for cracking of the primary to secondary pressure boundary due to PWSCC of tube-to-tubesheet welds using one of two options, analysis or inspection.

a. Inspection Scope

The inspectors reviewed the commitment implementation plan and discussed this commitment with applicable plant staff. While a final inspection plan had not been established, the preparations were underway. The inspectors reviewed CR-IP2-2013-01440, Revision 2, which described the ongoing work. The inspectors noted the commitment schedule for the plan on Unit 3 would be sooner (prior to the end of the first refueling outage after December 12, 2015) than the plan on Unit 2 (prior to March 2024). This schedule was based on the replacement of Unit 2 steam generators in 2000 while the Unit 3 steam generators were replaced in 1989, with steam generator service years of about 13 and 24 years, respectively, for each unit.

Findings and Observations

No findings were identified.

- .2.36 Commitment 43: IPEC will review design basis ASME Code Class 1 fatigue evaluations to determine whether the NUREG/CR-6260 locations that have been evaluated for the effects of the reactor coolant environment on fatigue usage are the limiting locations for the IP2 and IP3 configurations. If more limiting locations are identified, the most limiting location will be evaluated for the effects of the reactor coolant environment on fatigue usage. IPEC will use the NUREG/CR-6909 methodology in the evaluation of the limiting locations consisting of nickel alloy, if any.

a. Inspection Scope

The inspectors noted that Entergy has awarded contracts to perform the calculations that will support closure of this commitment. The inspectors also noted that Entergy and its vendor have completed initial screening calculations to determine the locations that may require further analysis.

Findings and Observations

No findings were identified; however, the inspectors determined that additional inspection was merited regarding review of the results of the calculations and any changes to the Thermal Cycle Monitoring Program procedure.

- .2.37 Commitment 44: Entergy will include written explanation and justification of any user intervention in future evaluations using the WESTEMS™ Design CUF module.
- .2.38 Commitment 45: Entergy will not use the ASME Code Section III, NB-3600 option of the WESTEMS™ program in future design calculations until the issues identified during the NRC review of the program have been resolved.

a. Inspection Scope

The inspectors noted that Entergy has revised procedure 2-PT-2Y015, Thermal Cycle Monitoring Program, to incorporate the two restrictions described in Commitments 44 and 45. The inspectors also noted that this procedure would be referenced whenever fatigue calculations would be developed or modified. The inspectors further noted that if an engineer were to inadvertently not use 2-PT-2Y015, procedures EN-LI-100, Process Applicability Determination, and EN-AD-101, Procedure Process, the procedures which control changes, tests and experiments, and procedure changes include a required review of all NRC commitments. These two procedures (i.e., EN-LI-100, EN-AD-101) would act as a backup to the thermal cycling monitoring procedure.

Findings and Observations

No findings were identified.

- .2.39 Commitment 46: Include in the IP2 ISI Program that IPEC will perform 25 volumetric weld inspections of socket welds during each 10 year interval scheduled as specified by IWB-2412 of the ASME Section XI Code during the period of extended operation. In lieu

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of volumetric examinations, destructive examinations may be performed, where one destructive examination may be substituted for two volumetric examinations.

a. Inspection Scope

The inspectors reviewed SEP-ISI-IP2-001, Revision 1, IP2 Fourth Ten-Year Interval Inservice Inspection (ISI)/ Containment Inservice Inspection (CII) Program Plan, dated June 20, 2012, Section 2.1.27 Examination Category R-A, Risk Informed Piping Welds, wherein Entergy states: "Per ASME B&PV Code Case N-578-1, the only examination that is required on a socket weld is a VT-2 visual examination each refueling outage. However per License Renewal Commitment #46 (LO-LAR-2011-0174 CA 65), twenty-five volumetric weld metal inspections of socket welds should be performed periodically during each 10 year ISI interval scheduled as specified by IWB-2412 of the ASME Section XI Code during the period of extended operation. In lieu of volumetric examinations, destructive examinations may be performed, where one destructive examination may be substituted for two volumetric examinations."

The IP2 Inservice Inspection Program was revised to include the provision to perform 25 volumetric weld inspections of socket welds during each 10 year interval scheduled as specified by IWB-2412 of the ASME Section XI Code during the period of extended operation. The IP2 Inservice Inspection Program was revised to include the option of substituting one destructive examination for two volumetric examinations.

Findings and Observations

No findings were identified.

- .2.40 Commitment 47: IPEC will perform and submit analyses that demonstrate that the lower support column bodies will maintain their functionality during the period of extended operation considering the possible loss of fracture toughness due to thermal irradiation embrittlement. The analyses will be consistent with the IP2/IP3 licensing basis.

a. Inspection Scope

The inspectors reviewed the plans for implementation of these commitments. The programs supporting the identified actions were in the early stage of implementation and awaiting analysis results. For example the screening criteria of Electric Power Research Institute Technical Report 1013234, Materials Reliability Program: Screening Categorization, and Ranking of Reactor Internals Components for Westinghouse and Combustion Engineering PWR Design, (MRP-191), listed in Table 3-5, were applied to the Indian Point components listed in Table 5-1 of Electric Power Research Institute Report 1022863, Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227-A). A site document had not been developed that defined and implemented this program. In Entergy letter NL-13-052, dated May 7, 2013, Entergy requested an extension in the scheduled completion date for this commitment until March 1, 2015.

Findings and Observations

No findings were identified; however, the inspectors determined that additional inspection was merited regarding the results of the ongoing analysis and implementation of the program, pending NRC action on the schedule extension.

- .2.41 Commitment 48: Entergy will visually inspect in-scope underground piping prior to the period of extended operation and then on a frequency of at least once every 2 years during the period of extended operation. Visual inspections will be supplemented with surface or volumetric non-destructive testing if indications of significant loss of material are observed. Adverse indications will be entered into the plant corrective action program for evaluation of extent of condition and for determination of appropriate corrective actions (e.g., increased inspection frequency, repair, replacement).

a. Inspection Scope

The inspectors reviewed preventive maintenance requests for inspection of three in-scope underground piping locations. These preventive maintenance requests specified a 2 year interval and stated that visual inspections will be supplemented with surface or volumetric non-destructive testing if indications of significant loss of material are observed. The requests also designate the activities as a commitment for license renewal. The inspectors noted that if adverse conditions are detected, the corrective action program is expected to direct the appropriate extent of condition review and corrective actions. The inspectors also noted that work orders have been issued to perform the inspections to be conducted prior to the period of extended operation.

Findings and Observations

No findings were identified. The inspectors determined that additional inspection was merited regarding review of the results of the underground piping inspections.

Program Review

Boric Acid Corrosion Control, Existing Aging Management Program (AMP)

a. Inspection Scope

The Boric Acid Corrosion Prevention Program is an existing program that relies on implementation of recommendations of NRC Generic Letter 88-05 to monitor the condition of components on which borated reactor water may leak. The program detects boric acid leakage by periodic visual inspection of systems containing borated water for deposits of boric acid crystals and the presence of moisture; and by inspection of adjacent structures, components, and supports for evidence of leakage. During plant operation accessible portions of the plant are monitored for boric acid leakage and during plant refuel outages the inspections for boric acid leakage are extended to areas of the plant usually inaccessible during plant operation. The program includes provisions for evaluation when leakage is discovered by other activities. Program improvements have been made as suggested in NRC Regulatory Issue

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Summary 2003-013. The Boric Acid Corrosion Prevention Program was enhanced to include recommendations of the Westinghouse Owner's Group WCAP-15988-NP "Generic Guidance to Best Practice 88-05 Boric Acid Inspection Program," EPRI Technical Report 1000975 "Boric Acid Corrosion Guidebook," and NRC Bulletin 2003-02 "Leakage from Reactor Coolant Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." The Boric Acid Corrosion Prevention Program is consistent with the program described in NUREG-1801, Section XI.M10, Boric Acid Corrosion.

Findings and Observations

No findings were identified.

Time Limited Aging Analysis Review

a. Inspection Scope

Time-limited aging analyses (TLAA) are plant-specific safety analyses that are based on an explicitly assumed 40-year plant life as defined in 10 CFR 54.3. Time-limited aging analyses are dispositioned in pursuant to 10 CFR 54.21(c)(1). Entergy must demonstrate that either: (1) the TLAAs will remain valid for the period of extended operation, as required by 10 CFR 54.21(c)(1)(i); or (2) the TLAAs have been projected to the end of the period of extended operation, as required by 10 CFR 54.21(c)(1)(ii); or (3) that the effects of aging on intended functions will be adequately managed for the period of extended operation, as required by 10 CFR 54.21(c)(1)(iii). The inspectors identified one neutron fluence TLAA as well as evaluations associated with environmentally-assisted fatigue that Entergy had dispositioned in accordance with 10 CFR 54.21(c)(1)(iii) and had associated with license renewal commitments.

The inspectors determined that Entergy had committed (Commitment 38) to update the neutron fluence TLAA calculations should there be changes in the fuel loadings that are not bounded by current analytical assumptions. The inspectors' evaluation of the status of Commitment 38 is documented above.

The inspectors determined that Entergy had made four commitments related to the evaluations of environmentally-assisted fatigue. Entergy committed (Commitment 33) to update the fatigue usage calculations for those locations identified in NUREG/CR-6260 using refined fatigue analyses to determine valid cumulative usage factors (CUF) less than 1.0 when accounting for the effects of reactor water environment. Entergy also committed (Commitment 43) to review design basis ASME Code Class 1 fatigue evaluations to determine whether the NUREG/CR-6260 locations that have been evaluated for the effects of the reactor coolant environment on fatigue usage are the limiting locations for the IP2 and IP3 configurations. Entergy committed (Commitment 44) to include written explanation and justification of any user intervention in future evaluations using the WESTEMS "Design CUF" module. Entergy also committed (Commitment 45) that it will not use the NB-3600 option of the WESTEMS program in future design calculations until the issues identified during the NRC review of the

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program have been resolved. The inspectors' evaluations of the status of Commitments 33, 43, 44, and 45 are documented above.

Findings and Observations

No findings were identified.

4OA6 Meetings, Including Exit

On May 23, 2013, the inspectors presented the inspection results to Mr. Donald Mayer, acting Site Vice President, and other members of the Entergy staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report. The exit meeting was attended by James Trapp, Chief, Engineering Branch 1.

ATTACHMENT: SUPPLEMENTARY INFORMATION

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SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Entergy Personnel

J. Ventosa, Site Vice President
N. Azevedo, Code Programs Supervisor
C. Caputo, License Renewal Team
T. Chan, Mechanical Systems Supervisor
P. Conroy, Nuclear Safety Assurance Director
J. Curry, License Renewal Project Manager
G. Dahl, Licensing Engineer
R. Dolanksy, ISI Program Manager
R. Drake, Civil Design Engineering Supervisor
J. Flagg, Selective Leaching Inspector
P. Guglielmino, Implementation Team Manager
S. Manzione, Components Engineering Supervisor
D. Mayer, Unit 1 Director
T. McCaffrey, Design Engineering Manager
T. Orlando, License Renewal Team
D. Pennino, Senior Program Engineer
J. Quirk, Selective Leaching Coordinator
M. Tesoriero, Programs and Components Manager
M. Troy, Plant Programs Supervisor
R. Walpole, Licensing Manager
M. Woodby, Engineering Director

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Open

The inspectors determined that the following 11 commitments merited further inspection:

- 6 Fatigue cycles analysis
- 13 Metal enclosed bus inspection
- 19 One-time inspection
- 23 Selective leaching inspection
- 26 Embrittlement of CASS analysis
- 27 Embrittlement of CASS analysis
- 33 Fatigue monitoring
- 40 Operating experience for new programs
- 43 Fatigue monitoring analysis
- 47 Reactor vessel lower support analysis
- 48 Underground piping inspection

Closed

The remaining 30 commitments reviewed were being or had been appropriately implemented.

LIST OF ACRONYMS

ACI	American Concrete Institute
ADAMS	Agencywide Documents Access Management System
AMP	Aging Management Program
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
CAP	Corrective Action Program
CASS	Cast Austenitic Stainless Steel
CFR	Code of Federal Regulations
CIIWL	Containment Isolation Inspection
CR	Condition Report
CRDM	Control Rod Drive Mechanism
EC	Engineering Change
ECT	Eddy Current Examination
EDG	Emergency Diesel Generator
ENTERGY	Entergy Nuclear Northeast
EPRI	Electric Power Research Institute
EQ	Environmentally Qualified
FSAR	Final Safety Analysis Report
GALL	Generic Aging Lessons Learned
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPEC	Indian Point Energy Center
IR	Inspection Report
ISI	Inservice Inspection
LER	Licensee Event Report
LRA	License Renewal Application
MEB	Metal-Enclosed Bus
NCV	Non-Cited Violation
NDE	Nondestructive Examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
PEO	Period of Extended Operation
PM	Preventive Maintenance
PWSCC	Primary Water Stress Crack Corrosion
RCS	Reactor Coolant System
RFO	Refueling Outage

SCC	Stress Crack Corrosion
SG	Steam Generator
SSC	Structure, System, and Component
TAA	Time-Limited Aging Analyses
UFSAR	Updated Final Safety Evaluation Report
UT	Ultrasonic Test
VT	Visual Examination
WO	Work Order

LIST OF DOCUMENTS REVIEWED

Commitment 1

LO-LAR-2011-0174 CA 43
CR IP2-2013-01989
327152-Revision 2, Building and Structures Identification Plan
A216386-Revision 2, Fire Water Storage Tank
AA-88, Revision 0, City Water Storage Tank, Graver
EN-DC-178, Revision 5, System Walkdowns
2-PI-SA002, Revision 7 Atmospheric Tanks, External Inspection

Commitment 2

IP-RPT-11-LRD03, Review of the Bolting Integrity AMP for License Renewal Implementation, Revision 0
EN-MA-145, Revision 0, Maintenance Standard for Torquing Applications
LO-LAR-2011-00174, CA-68

Commitment 3

EN-DC-343, Underground Piping and Tanks Inspection and Monitoring Program, Revision 8
SEP-UIP-IPEC, Underground Components Inspection Plan, Revision 1
CEP-UPT-0100, Underground Piping and Tanks Inspection and Monitoring, Revision 2
Buried Piping and Tanks General Visual Inspection Report, 11/12/2008, Condensate Storage Tank to Auxiliary Feedwater Pump Suction Line 1505 and Condensate Storage Tank Recirculation Line 1509 – Upper and Lower Excavations
CR-IP2-2008-04754, Coating Degradation Condensate Storage Tank Lines
Buried Piping and Tanks General Visual Inspection Report, 4/21/2009, Condensate Storage Tank Recirculation Line 1509 –Outside of Auxiliary Feedwater Pump Room
Buried Piping and Tanks General Visual Inspection Report, 11/28/2011, Circulating Water Line – 26 Circulating Water Pump Discharge to 23 Main Condenser
Buried Piping and Tanks General Visual Inspection Report, 10/21/2009, City Water Line Inspections – 16-Inch line from City Water Storage Tank
CR-IP2-2013-00131, Coating Degradation City Water Line from City Water Storage Tank
Buried Piping and Tanks General Visual Inspection Report, 9/14/12, City Water Line 1502 to Auxiliary Feedwater Pumps

Buried Piping and Tanks General Visual Inspection Report, 12/13/12, City Water Line 1502 to Auxiliary Feedwater Pumps

Buried Piping and Tanks General Visual Inspection Report, 9/14/12, 8-Inch High Pressure Fire Protection Line in 22 Moat Area at Electrical Tunnel Penetration and in 22 Moat Area at North Wall

CR-IP2-2013-05324, Coating Degradation 8-Inch High Pressure Fire Protection Line in 22 Moat Area at North Wall

Buried Piping and Tanks General Visual Inspection Report, 12/13/12, 6-Inch High Pressure Fire Protection Line to Hydrant 26

Buried Piping and Tanks General Visual Inspection Report, 8/29/12, 8-Inch Service Water Line 463 SE Return Line from the EDGs in 22 Moat Area at North Wall

CR-IP2-2013-05324, Coating Degradation Service Water Line 463 SE Return Line from the EDGs in 22 Moat Area at North Wall

Buried Piping and Tanks General Visual Inspection Report, 11/22/11, 24-Inch Main Service Water Line 408 and Line 409 at Existing Access Port on West Side of Turbine Building

CR-IP2-2012-06248, Coating Degradation 24-Inch Main Service Water Line 408 at Existing Access Port on West Side of Turbine Building – Intradose of Elbow on Line 408

Buried Piping and Tanks General Visual Inspection Report, 12/13/12, 24-Inch Main Service Water Line 405 Return to Discharge Canal at 22 Moat Area and Line 408 and Line 409 Supply Header at 22 Moat Area

CR-IP2-2013-00131, Coating Degradation 24-Inch Main Service Water Line 405 Return to Discharge Canal at 22 Moat Area, Line 408 Supply Header at 22 Moat Area, and 1.5-Inch Weld Channel Piping to Penetration

Buried Piping and Tanks General Visual Inspection Report, 12/13/12, 1.5-Inch Weld Channel Piping to Penetration

Buried Piping and Tanks General Visual Inspection Report, 10/10/12, 8-Inch HP Fire Protection Line and 8-Inch City Water Line 1502 in the IP2 Transformer Yard

Commitment 4

LO-LAR-2011-00174

A.2.1.8 Diesel Fuel Monitoring Program

B.1.9 Diesel Fuel Monitoring Program

3-SOP-EL-009, Filling the Diesel Fuel Oil Storage Tanks, Revision 22

0-CY-1500, Chemistry Sampling Locations, Revision 23

0-CY-1560, Sampling and Adding Chemicals to Diesel Fuel Oil Storage Tanks, Revision 5

0-CY-1810, Diesel Fuel Oil Monitoring, Revision 14

0-CY-1810, Diesel Fuel Oil Monitoring, Revision 15

0-CY-3318, Water and Sediment in Fuel Oil, Revision 4

3-CY-2615, Adding Chemicals to Auxiliary Systems, Revision 1

0-GNR-402-ELC, Emergency Diesel Generator Main Fuel Oil Tank 10-Year Maintenance, Revision 3

2-SOP-29.20, Fuel Oil Transfer Using the Trailer, Revision 8

IP-RPT-11-LRD10, Review of the Diesel Fuel Monitoring Aging Management Program For License Renewal Implementation, Revision 0

Report on the 2012 Inspection of the Entergy Nuclear Operations Indian Point Station

No. 2 Fuel Oil Storage Tank GT2/3 FOT, November 27, 2012

00347381, Fuel Oil Storage Tank Bottom Thickness UT
00349623, Fuel Oil Storage Tank Open, Clean & Inspect

Commitment 5

Condition Report CR-IP2-2013-01756 Revision 2 of ENN-MS-S-004
EN-DC-178, Revision 5, System Walkdowns
ENN-MS-S-004-IPEC, Rev 2 that documents the system categories
EN-DC-159, Revision 6, System Monitoring Program

Commitment 6, 33, 43, 44, and 45

2-PT-2Y015, Revision 3, Thermal Cycle Monitoring Program
IP-RPT-11-LRD13, Revision 0, Review of the Fatigue Monitoring Aging Management Program
for License Renewal Implementation
EN-LI-100, Revision 13, Process Applicability Determination
EN-AD-101, Revision 16, Procedure Process
WCAP-17199-P, July 2010, Environmental Fatigue Evaluation for Indian Point Unit 2
WCAP-17149-P, July 2010, Evaluation of Pressurizer Insurge/Outsurge Transients for Indian
Point Unit 2
Entergy Letter dated August 9, 2010 (NL-10-82), License Renewal Application – Completion of
Commitment #33 Regarding the Fatigue Monitoring Program Indian Point Nuclear
Generating Unit Nos. 2 and 3 [ML102300504]

Commitment 7

2-ENG-003-FIR, Detroit Diesel V-71, Emergency Fire Pump Diesel PM, Revision 5
2-PT-M040, Diesel Fire Pump, Revision 30
IP-RPT-11-LRD14, Review of the Fire Protection Aging Management Program for License
Renewal Implementation, Revision 2
SAO-703, Fire Protection Impairment Criteria and Surveillance, Revision 32

Commitment 8

2-PT-A017QA, Fire Hose Stations Inspections, Revision 8
A138057, City Water Supply Pipeline, Revision 18
CR-IP2-2004-01864, pin hole leak in fire water pipe
CR-IP2-2011-05889, Three pin hole leaks in fire water piping
IP2-UT-11-051/52/53, IP2-UT-12-016 thru 24, IP2-UT-12-026, and IP2-UT-12-028, Ultrasonic
Test Reports for Fire Protection Piping, performed between 12/11 and 7/12
IP-RPT-11-LRD15, Review of the Fire Water System Aging Management Program for License
Renewal Implementation, Revision 0
IP-RPT-12-LRD02, Fire Water Piping Wall Thickness Evaluation for License Renewal,
Revision 0
SAO-703, Fire Protection Impairment Criteria and Surveillance, Revision 32
SE-86-59, Specification for Fire Standpipe Systems and City Water Piping, Revision 0
Work Order 134345, Main Turbine Lube Oil Fire Protection Foam Tank Refill, performed 6/12/08
Work Order 339750, 10-year Fire Water Piping UT Inspections

Work Order NP-01-22451, Main Feed Pump Lube Oil Fire Protection Foam Tank Drain & Refill, performed 8/01/01

Work Orders 334193, 334196, 334198, and 334200, 4-year Visual Inspection of Foam Tank Internal Surfaces for Significant Corrosion

Work Orders 335678, 335680, 335684, and 335686, 50-year Replacement of Sprinkler Heads

Commitment 9

Corrective Action document LO-LAR-2011-00174, CA 06

A206913-1, Reactor Vessel Inspection Identification DWG, for U2

A209564-1, Reactor Vessel bottom mounted instrumentation, for U2

Mistras Procedure 583-ET-008, Revision 1 for Eddy Current Inspection of Incore Thimble Tubes

IP-Calc-07-00038 dated 2/15/2007 on Reinspection frequency for IP3 Thimble Tubes

Mistras Eddy Current test results for Unit 2 and Unit 3 Thimble tubes dated 3/16/09, 3/18/10, and 3/9/12 (U2)

Commitment 10

IP-RPT-11-LRD18, Revision 0, Review of the Heat Exchanger Performance and Condition Monitoring Program

EN-DC-316, Revision 5, Heat Exchanger Performance and Condition Monitoring

SEP-HX-IP-001, Revision 1, IPEC Heat Exchanger/Eddy Current Program

Commitment 10 Implementation Matrix, May 4, 2013

IPEC Heat Exchanger and Eddy Current Inspection Program Data

MWO 332520-01

MWO 349349-01

PMRQ 30855-01

PMRQ 31465-02

Commitment 12, 25, and 37

EN-DC-150, Rev. 4, Structural monitoring Program

Specific IPEC inspection requirements, Attachment to EN-DC-150, Structural Monitoring Program

Entergy Letter dated August 14, 2008, Commitment 37

Safety Evaluation Report Nureg 1930, Volume 2,

ASME Code, Section XI, Sub Sec. IWL

ASME IWL inspections performed in 2005 and 2009 using enhanced visual aids

ASTM C33-90, Guidance for Freeze-Thaw Monitoring

ER No. IP-RPT-11-00002, Revision 0, January 10, 2011, Assessment of Concrete Aging from Selected Indian Point Structures

Commitment 13

2-ELC-016-BUS, Inspection, Cleaning and Testing of 480V Buses, Revision 2

CR-IP2-2009-03029, Inspect electrical supports affected by water dripping at the bend in the electric tunnel. Initiate corrective actions where required.

CR-IP2-2012-01903, Bus 5A surface rust noted on the interior divider panel

Work Order 52293872, Inspection of Bus 5A Switchgear and Station Service Transformer
Work Order 52294517, Inspection of Bus 5A (480 V Switchgear to EDG)

Commitment 14

IP-RPT-11-LRD23, Revision 0, Review of the Non-EQ Bolted Cable Connections Aging Management

Program for License Renewal Implementation.

IP-RPT-13-LRD01, Non-EQ Bolted Cable Connection Evaluation, Revision 0

Work Orders related to Bolted Cable Connection Inspection Samples:

52249670, 52249670, 52339357, 52293872

Commitment 15

CR-IP2-2012-01307, The 'C' phase Tan Delta values obtained were noticeably higher than the remaining 2 phases for 24 CWP.

CR-IP2-2013-01480, During License Renewal walkdowns, deficiencies were noted with cables that were not part of the program.

EN-DC-346, Cable Reliability Program, Revision 5

EN-MA-138, VLF Tan Delta and Withstand Testing of Electrical Power Cables, Revision 1

Work Orders related to periodic preventive maintenance inspection and dewatering of various manholes: 52477039, 52459080, 52471206, 52449618, 52449619, 52449801, 52431438, 52431439, 52450288, 52431268, 52454018, 52454019

Commitment 16

IP-RPT-11-LRD25, Review of the Non-EQ Instrumentation Circuits Test Review Aging Management Program for License Renewal Implementation

Report on ECAD Testing at Indian Point Unit 2, Dated November 2004

System Health Report for NI System (1st QT 2013)

Work Order 32099001, 4Y PEO Test Integrity of NI Cables N-31, N-32

Work Order 32099701, 4Y PEO Test Integrity of NI Cables N-35, N-36

Work Order 32100101, 4Y PEO Test Integrity of NI Cables N-41A/B through N-44A/B

Work Order 34926901, 8Y PEO Review of NI Calibration & Test Results

Work Order 51800948, High Range Containment Area Radiation Monitor R26 Calibration Test (3/11/10)

Work Order 51800949, High Range Containment Area Radiation Monitor R25 Calibration Test (3/11/10)

Work Order 52246190, High Range Containment Area Radiation Monitor R25 Calibration Test (3/15/12)

Work Order 52246191, High Range Containment Area Radiation Monitor R26 Calibration Test (3/11/12)

Commitment 17

CR-IP2-2013-01480 and -01607, Cable walkdown deficiencies identified
Data Walkdown Sheets (e.g., field observation notes) for 21 RHR Pump Room, Primary
Auxiliary Bldg (PAB) 15 foot elevation Piping and Valve Room, PAB Chemical Drain
Tank Room, PAB Filter Room, PAB Large Gas Decay Tank Room, Electrical Cable
Tunnel, Turbine Bldg (TB) Ground Floor - West, and TB Ground Floor - North West,
walkdowns performed between 7/22/10 and 8/03/10
EN-DC-348, Non-EQ Insulated Cables and Connections Inspection, Revision 4
IP-RPT-10-LRD15, Cable and Connection Inspection Summary Report, Revision 0
IP-RPT-11-LRD26, Review of the Non-EQ Insulated Cables and Connections Aging
Management Program for License Renewal Implementation, Revision 0
Work Order 348737 and 348751, 8-year Cable & Connection Inspection

Commitment 18

LO-LAR-2011-00174
A.2.1.25 Oil Analysis Program
B.1.26 Oil Analysis Program
EN-DC-335, Nuclear Management Manual, Revision 4
EN-DC-149, Entergy Nuclear Management Manual, Rev. 6
SEP-LUB-IPC-001, IPEC Lubrication Program, Revision 0
SEP-LUB-IPC-002, IPEC Oil Analysis Program, Revision 0
SEP-LUB-IPC-002, IPEC Oil Analysis Program, Revision 1
PM Basis Template, EN – Pump – Horizontal with Couplings, Revision 4

Commitment 19

IP-RPT-11-LRD28, Revision 0, Review of the One-Time Inspection Program
EN-FAP-LR-024, Revision 1, One-Time Inspection
NL-13-046, Amendment 13 to LRA for One-Time Inspection and Selective Leaching Programs,
March 18, 2013
IPEC Unit 2 One-Time Inspection Tracking Matrix, May 3, 2013 and May 21, 2013
20 Inspection reports for one-time inspections

Commitment 20

UT Calibration Examination and Report Sheets:

206723-969A CVC CW Elbow-to-Pipe Component 96 9A
206723-969B CVC Circ-Weld Component 96 9B
206723-963.RI CVC Circ-Weld Component 96 3
206723-964.RI CVC Circ-Weld Component 96 4
206723-962.RI CVC Circ-Weld Component 96 2
206713-793.RI CVC Circ-Weld Component 79 3

Corrective Action LO-LAR-2011-00174 NRC Commitment #20
Commitment Closure Verification Form IP2 A-3230/ LO-LAR-2011-00174 -12

Entergy Letter NL-07-153, "Amendment 1 to License Renewal Application (LRA)," 12/18/2007
Entergy Letter NL-10-076, "Amendment 10 to License Renewal Application (LRA)," 7/26/2010
Entergy Letter NL-11-032, "Response to Request for Additional Information," 3/28/2011
Entergy Letter NL-11-074, "Response to Request for Additional Information," 7/14/2011
LR Request #173
IP-RPT-11-LRD29, Revision 0, "Review of the One-Time Inspection – Small Bore Piping Program for License Renewal Implementation," 1/16/2013

Commitment 21

IP-RPT-11-LRD30, Review of the Periodic Surveillance and Preventive Maintenance Aging Management Program for License Renewal Implementation, Revision 0
0-PT-M002, Alternate Safe Shutdown Equipment Inventory and Inspection, Revision 8
2-PT-Q033A, 21 Charging Pump, Revision 17
LO-LAR-2011-00174
A.2.1.28 Periodic Surveillance and Preventive Maintenance Program
B.1.29 Periodic Surveillance and Preventive Maintenance
WO 00307819, U2 offsite power feeder 138 kV underground transmission cable
WO 00332413, Unit 2 SBO/Appendix R Diesel Generator
WO 00334380, Station Air System
WO 00324716, Circulation Water System
WO 00334184, Emergency Diesel Generator System

Commitment 22

Corrective Action LO-LAR-2011- 00174, "Enhance the Reactor Vessel Surveillance Program," 8/20/2011
Entergy Letter NL-07-140, "Reply to Request for Additional Information Regarding License Renewal Application," November 28, 2007
Entergy Nuclear Management Manual, EN-DC-149 Revision 6, Vendor Document Review Status, "Review of the Reactor Vessel Surveillance Aging Management Program for License Renewal Implementation, EC38922," 1/2/2013
Westinghouse WCAP-16752-NP, Revision 0, "Indian Point Heatup and Cooldown Limit Curves for Normal Operation," January 2008.

Commitment 23

IP-RPT-11-LRD34, Revision 0, Review of the Selective Leaching Program
EN-FAP-LR-02, Revision 3, Selective Leaching Inspection
NL-13-046, Amendment 13 to LRA for One-Time Inspection and Selective Leaching Programs, March 18, 2013
IPEC Unit 2 Selective Leaching Inspection Tracking Matrix, May 20, 2013
10 Inspection reports for copper-alloy selective leaching inspections
12 Inspection reports for gray cast iron selective leaching inspections
WO 00326036-01
WO 00326216-01

Commitment 24

Corrective Action document LO-LAR-2011-0174 CA 17
SEP-SG-IP2-001, Revision 0, IP2 Steam Generator Program
SEP-SG-IP3-001, Revision 0, IP3 Steam Generator Program
EN-DC-317, Revision 7, Steam Generator Program
IP-RPT-11-LRD36, Revision 0, Review of the Steam Generator Integrity Aging Management Program for License Renewal Implementation

Commitment 26

Entergy Letter, NL-09-018, "Reply to Request for Additional Information – Miscellaneous Items," January 27, 2009
Entergy Letter NL-11-101, "Clarification for Additional Information (RAI) Aging Management Programs," August 22, 2011
LR# 173, LR Request, Confirm each AMP will be implemented with ten elements
IP-RPT-11-LRD38, "Review the Thermal Aging Embrittlement of CASS Aging Management Program for License Renewal Implementation," 1/2/2013
NRC Letter, "License Renewal Issue No. 98-0030, "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel Components," May 19, 2000
WCAP-10977, Supplement 1, "Additional Information in Support of the Technical Justification for Eliminating Large Primary LOOP Pipe Rupture as the Structural Design Basis for Indian Point Unit 2," January 1989

Commitments 27, 47

IP-RPT-11-LRD39, Revision), "Review of the Thermal Aging & Neutron Embrittlement of CASS Aging Management Program for License Renewal Implementation," ED41109, 1/23/2013
EPRI 1013234 "Materials Reliability Program: Screening, Categorization, and Ranking of Reactor Internals Components for Westinghouse and Combustion Engineering PWR Design (MRP-191)," November 2006
EPRI 1022863 "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227-A)," December 2011
NRC Letter "Request for Additional Information for the Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3, License Renewal Application," May 15, 2012
Entergy Letter, NL-11-101, "Clarification for Request for Additional Information (RAI) Aging Management Programs," 8/22/2011
Entergy Letter NL-13-052, "Reply to Request for Additional Information Regarding the License Renewal Application," 5/7/2011
LR Request #173 Confirm new programs will be implemented consistent with 10 elements of NUREG-1801.
IP-RPT-11-LRD39 "Review of the Thermal Aging & Neutron Irradiation Embrittlement of CASS Aging Management Program for License Renewal Implementation," EC41109, 1/2/13

Commitment 30

Entergy Letter NL-10-063, "Amendment 9 to License Renewal Application (LRA) – Reactor Vessel Internals Program," dated 7/14/2010
Entergy Letter NL-11-101, "Clarification for Request for Additional Information (RAI), Aging Management Programs," 08/22/2011
Entergy Letter NL-11-107, "License Renewal Application – Completion of Commitment #30 Regarding the Reactor Vessel Internals Inspection Plan," 09/28/2011
Entergy Letter NL-12-037, "License Renewal Application – Revised Reactor Vessel Internals Program and Inspection Plan Compliant with MRP-227-A," 02/17/2012
Entergy Letter NL-12-089, "Reply to Request for Additional Information Regarding the License Renewal Application," 06/14/2012
Entergy Letter NL-12-134, "Reply to Request for Additional Information Regarding the License Renewal Application," 09/28/2012
Entergy Letter NL-12-140, "Reply to Request for Additional Information Regarding the License Renewal Application," 10/17/2012
IP-RPT-11-LRD43, "Review of the Reactor Vessel Internals Aging Management Program for License Renewal Implementation," EC40997, Revision 0, 4/10/2013

Commitment 31

Entergy Letter NL-13-001, Proposed Changes to Indian Point 2 Technical Specifications Regarding reactor Vessel Heatup and Cooldown Curves and Low Temperature Over Pressure Requirements. 2/6/2013
Entergy Letter NL-07-140, NRC letter dated October 28, 2007; "Requests for Additional Information for the Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3, License Renewal Application"

Commitment 35

Work order No. 00282078-01 for inspection of representative sample area of the IP2 containment liner affected by the 1973 event behind the insulation
Work order No. 00316062-01 for the Unit 3 one time inspection containment steel liner at the juncture with the concrete floor slab.
Drawing A202453, Revision 28, Containment building, Elv 68', South Half

Commitment 38

Entergy Letter NL-08-143, "Additional Information Regarding License Renewal Application – Reactor Vessel Fluence Clarification," 9/24/2008
Entergy Letter NL-11-101, "Clarification for Request for Additional Information (RAI) Aging Management Programs," 8/22/2011
IP-RPT-11-LRD33, "Review of Reactor Vessel Surveillance Aging Management Program for License Renewal Implementation," 1/2/2013

Commitment 41

Corrective Action document LO-LAR-2011-0174 CA 58, 59, for commitment closure
IP-RPT-11-LRD36, Revision 0. Review of the Steam Generator Integrity Aging Management
Program for License Renewal Implementation
EPRI report on Divider Plate cracking presented at the SGMP Meeting in June 2012
EPRI Technical Report # 3002000411, dated April 2013 on the Flaw Tolerance Evaluation of
the Steam Generator Channel Head

Commitment 42

LO-LAR-2011-0174 CA 60, 61
Corrective Action document LO-LAR-2011-0174 CA 60, 61, for commitment closure
Condition Report CR-IP2-2013-01440, Revision 2
IP-RPT-11-LRD36, Revision 0. Review of the Steam Generator Integrity Aging Management
Program for License Renewal Implementation
Aging Management SER section 3.1.2.2.17, Cracking due to SCC and PWSCC

Commitment 46

As referenced in the report.

Commitment 48

Work Order PMRQ 00349816-01, 23 Fuel Oil Storage Tank Underground Piping Inspections
Work Order PMRQ 00349802-01, 21 Fuel Oil Storage Tank Underground Piping Inspections
Work Order PMRQ 00349814-01, 22 Fuel Oil Storage Tank Underground Piping Inspections
Work Order 00342492-01, Inspect Underground Piping by the IP2 EDG Building DF-2 Area
Work Order 00342493-01, Inspect Underground Piping by the IP2 EDG Building DF-2-1 Area
Work Order 00342494-01, Inspect Underground Piping by the IP2 EDG Building DF-2-2 Area

2.B.1.5 Boric Acid Corrosion Control, Existing Aging Management Program (AMP)

Corrective Action document LO-LAR-2011-00174, CA 30
SEP-BAC-IPC-001, Revision 0, IP2, IP3 Site Boric Acid Corrosion Control Program
CEP-BAC-IPC-001, Revision 1, Corporate Boric Acid Corrosion Control Program Plan
EN-DC -319, Revision 9, Boric Acid Corrosion Control Program (BACCP)
2-PT-R156, Revision 4, RCS Boric Acid Leakage and Corrosion Inspection (during outages).
2-PT-Q092, Revision 7, Containment Building Inspection (during operation)
EN-DC-178, Revision 5, System Walkdowns
Engineering Report No. IP-RPT-11-LRD06, Revision 0, Review of the Boric Acid Corrosion
Prevention Aging Management Program for License Renewal Implementation