August 1, 2008

Mr. Joseph Pollock
Site Vice President
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNITS 2 AND 3 - NRC LICENSE RENEWAL INSPECTION REPORT 05000247/2008006 & 05000286/2008006

Dear Mr. Pollock:

On February 14, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed the major onsite portion of the Region I team inspection of your application for license renewal of your Indian Point Nuclear Generating Unit Nos. 2 and 3, with additional followup inspections through June 6, 2008. The enclosed report documents the results of the inspection, which were discussed on June 18, 2008, with you, Fred Dacimo, and members of your staff in an exit meeting open for public observation in Cortlandt Manor, NY.

The purpose of this inspection was to examine, on a sampling basis, the plant activities and documents that support the application for a renewed license of the Indian Point Nuclear Generating Unit Nos. 2 and 3. The inspection team reviewed the scoping of nonsafety-related systems, structures, and components, as required in 10 CFR 54.4(a)(2). Further, the team determined whether the proposed aging management programs are capable of reasonably managing the effects of aging. These NRC inspection activities constitute one of several inputs into the NRC review process for license renewal applications.

The team concluded that the scoping of nonsafety-related systems, structures, and components was implemented as required in 10 CFR 54.4(a)(2). Further, the team concluded that the aging management portion of the license renewal activities was conducted as described in the License Renewal Application. The team concluded that the documentation supporting the application was in an auditable and retrievable form. The team identified a number of areas that resulted in changes to the application.

Overall, the inspection results support a conclusion of reasonable assurance that actions have been identified and have been taken or will be taken to manage the effects of aging in the systems, structures, and components identified in your application and that the intended functions of these systems, structures, and components will be maintained in the period of extended operation.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document 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/

Richard J. Conte, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos. 50-247 and 50-286
License Nos. DPR-26 and DPR-64

Enclosure: Inspection Report 05000247/2008006 and 05000286/2008006

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REGION I

Docket Nos:	50-247, 50-286
License Nos:	DPR-26, DPR-64
Report Nos:	05000247/2008006 and 05000286/2008006
Licensee:	Entergy Nuclear Operations, Inc (Entergy)
Facility:	Indian Point Nuclear Generating Unit Nos. 2 and 3
Location:	450 Broadway, GSB Buchanan, NY 10511-0249
Dates:	January 28 – February 1, 2008 February 11 – 14, 2008 March 31 – April 2, 2008 June 2 – 6, 2008, and June 18, 2008
Inspectors:	G. Meyer, Team Leader, Division of Reactor Safety (DRS) M. Modes, Sr. Reactor Inspector, DRS J. Richmond, Sr. Reactor Inspector, DRS S. Chaudhary, Reactor Inspector, DRS H. Jones, Reactor Inspector, DRS B. Jose, Reactor Inspector, DRS, Region III J. Lilliendahl, Reactor Inspector, DRS D. Tifft, Reactor Inspector, DRS H. Gray, Sr. Reactor Inspector, DRS
Accompanied by:	B. Pham, NRR
Approved By:	Richard J. Conte, Chief Engineering Branch 1 Division of Reactor Safety

SUMMARY OF FINDINGS

05000247/2008006 and 05000286/2008006; January 28 – June 18, 2008; Indian Point Nuclear Generating Unit Nos. 2 and 3; Scoping of Non-Safety Systems and the Proposed Aging Management Programs for the Indian Point Application for Renewed License.

This inspection of license renewal activities was performed by nine regional office inspectors. The inspection was performed in accordance with NRC Manual Chapter 2516 and NRC Inspection Procedure 71002. This inspection did not identify any findings as defined in NRC Manual Chapter 0612. The inspection team concluded scoping of nonsafety-related systems, structures, and components was implemented as required in 10 CFR 54.4(a)(2). Further, the team concluded the aging management program portions of the license renewal activities were conducted as described in the License Renewal Application. The team concluded the documentation supporting the application was in an auditable and retrievable form. The team identified a number of areas that resulted in changes to the application.

Overall, the inspection results support a conclusion of reasonable assurance that actions have been identified and have been taken or will be taken to manage the effects of aging in the systems, structures, and components identified in your application and that the intended functions of these systems, structures, and components will be maintained in the period of extended operation.

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Report Details

4. OTHER ACTIVITIES (OA)

4OA2 Other - License Renewal

a. Inspection Scope (IP 71002)

This inspection was performed by NRC regional inspectors to evaluate the thoroughness and accuracy of the scoping of nonsafety-related systems, structures, and components, as required in 10 CFR 54.4(a)(2) and to evaluate whether aging management programs will be capable of managing identified aging effects in an appropriate manner.

The inspectors selected a number of systems, components, and structures for review to determine if the methodology applied by Entergy appropriately addressed the non-safety systems affecting the safety functions of a system, structure, or component within the scope of license renewal.

The inspectors selected a sample of aging management programs to verify the adequacy of Entergy guidance, implementation activities, and documentation. The selected aging management programs were reviewed to determine whether the proposed aging management implementing processes would adequately manage the effects of aging.

The inspectors reviewed supporting documentation and interviewed Entergy personnel to confirm the accuracy of the license renewal application conclusions. For a sample of plant systems and structures, the inspectors performed visual examinations of accessible portions of the systems to observe aging effects.

b.1. Scoping of Nonsafety-Related Systems, Structures, and Components

For scoping, the inspectors reviewed Entergy program guidance procedures and summaries of scoping results for Indian Point to assess the thoroughness and accuracy of the methods used to bring systems, structures, and components within the scope of license renewal into the application, including nonsafety-related systems, structures, and components, as required in 10 CFR 54.4 (a)(2). The inspectors determined Entergy procedures to be consistent with the NRC-accepted guidance in Sections 3, 4, and 5 of Appendix F to NEI 95-10, Industry Guideline For Implementing The Requirements of 10 CFR Part 54 – The License Renewal Rule, Revision 6 (3: nonsafety-related systems, structures, and components within scope of the current licensing basis, 4: nonsafety-related systems, structures, and components directly connected to safety-related systems, structures, and components, and 5: nonsafety-related systems, structures, and components not directly connected to safety-related systems, structures, and components).

The inspectors reviewed the set of license renewal drawings, which had been color-coded to indicate systems and components in scope for 10 CFR 54.4 (a)(1), in order to evaluate the effects of (a)(2) systems on the (a)(1) systems, structures, and

components. The inspectors interviewed personnel, reviewed license renewal program documents, and independently inspected numerous areas within Units 1, 2, and 3 to confirm that appropriate systems, structures, and components had been included within the license renewal scope, that systems, structures, and components excluded from the license renewal scope had an acceptable basis, and that the boundary for determining license renewal scope within the systems, including seismic supports and anchors, was appropriate.

The in-plant areas and systems reviewed included the following:

- Units 1, 2 & 3 Turbine Buildings*
- Unit 1 Nuclear Service Building*
- Unit 1 Fuel Handling Building*
- Unit 1 Chemical Systems Building*
- Unit 2 Primary Auxiliary Building
- Unit 2 Fuel Storage Building
- Unit 2 Reactor Building
- Unit 2 & 3 Control Buildings
- Units 2 & 3 Intake Structures
- Units 2 & 3 Security Generators
- Units 2 & 3 Diesel Generator Rooms
- Unit 3 Auxiliary Feedwater Pump Room
- Unit 3 480 V Switchgear Room
- Unit 3 Cable Spreading Room
- Unit 2 Station Blackout Diesel Generator
- Unit 3 Instrument Air System
- Units 2 & 3 Service Water Systems

* The License Renewal Application (LRA) applies to Units 2 and 3; Unit 1 structures and systems are addressed due to the potential effect on Units 2 and 3.

For systems, structures, and components selected regarding spatial interaction (failure of nonsafety-related components adversely affecting adjacent safety-related components), the inspectors determined that the in-plant configuration had been accurately and acceptably categorized within the license renewal program documents. The inspectors determined the personnel involved in the process were knowledgeable and appropriately trained.

For systems, structures, and components selected regarding structural interaction (seismic design of safety-related components dependent upon nonsafety-related components), the inspectors determined that structural boundaries had been accurately determined and categorized within the license renewal program documents. The inspectors determined that Entergy had reviewed applicable isometric drawings to determine the seismic design boundaries and had correctly included the applicable components in the license renewal application, based on the inspectors' independent review of a sample of the isometric drawings and the seismic boundary determinations.

In summary, the inspectors concluded that Entergy had implemented an acceptable method of scoping of nonsafety-related systems, structures, and components and that this method resulted in accurate scoping determinations.

b.2. Aging Management Programs

Containment Inservice Inspection Program

The Containment Inservice Inspection program is an existing program that manages the aging affects on the containment, which is a reinforced concrete structure without post tensioning. In the application, Entergy takes exception to NUREG 1801, Revision 1, because containment seals and gaskets are in the Containment Leak Rate Program and not in the Containment Inservice Inspection program. This conforms with the American Society of Mechanical Engineers (ASME) Code applicable to Indian Point, which is an edition later than that referenced in NUREG 1801, Revision 1.

The program specifies that all accessible surfaces receive a visual examination. The procedure for visual containment inspection also requires that inaccessible areas requiring inspection be separately identified. Painted surfaces are examined for evidence of flaking, blistering, peeling, discoloration, and other signs of distress. Non-coated areas are examined for evidence of cracking, discoloration, wear, pitting, excessive corrosion, gouges, surface discontinuities, dents and other signs of surface irregularities.

The inspectors reviewed the evaluation of concrete visual indications on the exterior of the Unit 2 containment. Following an inspection during the March – June 2000 outage, Entergy documented 22 indications of concrete pop-out, i.e., exposed rebar. The exposed rebar and Cadweld® had rusted, and in some cases rust stains had progressed down the outside of containment. Entergy performed an analysis which compared the indications against a structural analysis that divided containment into three zones of importance, each indicating the amount of rebar margins that existed in each zone. The analysis determined that no repairs were required and remediation would be ineffective at arresting further aging effects. The NRC inspectors reviewed the analysis and did not disagree with its determinations.

Entergy's monitoring of the concrete pop-outs has consisted of periodic evaluation of some pop-outs and making a qualitative determination of the amount of aging by reviewing prior photographs of the pop-out. There were no measurements or quantitative standards of acceptance applied. Without a method of consistent measurement, the inspectors questioned the effectiveness of monitoring or trending. Entergy agreed to correct this and issued CR-IP3-2008-00458 to establish baseline measurements of the indications and compare them against future measurements.

During the spring 2008 outage, the NRC inspectors entered the Unit 2 containment and reviewed some accessible areas of the containment liner to determine the visual condition of the liner. The inspectors also visually inspected some accessible areas of the liner-to-inside-sill seal and the areas previously ultrasonically thickness gauged.

For the Containment Inservice Inspection Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

Fatigue Monitoring Program

The Fatigue Monitoring Program is an existing program that tracks the relevant transients for selected reactor coolant system components. The components considered include the reactor vessel, reactor vessel internals, pressurizer, steam generators, and Class 1 piping and components. The program compares the transient data with the analyzed fatigue transients in order to assure the actual effective number of transients does not exceed the analyzed number of transients. The ratio of the counted transients to the analyzed transients is the usage factor.

The inspectors noted the following site-specific program enhancements in IP-RPT-06-LRD02, Section 4.2, Fatigue Monitoring:

> Unit 2 Enhancements: Revise appropriate procedures 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.
>
> Unit 3 Enhancements: Revise appropriate procedures to include all the transients identified. Assure all fatigue analysis transients are included with the lowest limiting numbers. Update the number of design transients accumulated to date.

The inspectors reviewed the program elements and implementation. The inspectors reviewed selected components and determined the adequacy of the process used to maintain the transient count for the component.

For the Fatigue Monitoring Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

Fire Protection Program

The Fire Protection Program is an existing program modified for the purpose of aging management and is credited with managing the aging effects in the fire barrier system and the diesel-driven fire pumps. The aging effects are managed by periodic inspection of fire barrier penetration seals, fire barrier walls, ceilings, and floors; and periodic inspection and testing of fire rated doors. Aging effects are also managed by the periodic inspection and testing of the diesel-driven fire pumps to ensure that the fuel supply line can perform its intended function.

The inspectors reviewed the existing fire protection program and supporting documents to verify the effectiveness of the program. The inspectors conducted interviews and performed walkdown inspections of various fire barriers throughout the plant to evaluate the effectiveness of the existing program. The inspectors also performed a walkdown inspection of the diesel-driven fire pumps and accessible portions of the associated fuel supply line. Surveillance procedures were reviewed for completeness and compliance with applicable codes. Also, program enhancements were reviewed for adequacy and completeness.

For the Fire Protection Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

Fire Water System Program

The Fire Water System Program is an existing program and is credited with managing the aging effects in water-based fire protection systems. The aging effects are managed by periodic testing and inspection of systems and components exposed to water, including sprinklers, nozzles, fittings, valves, hydrants, hose stations, standpipes, and above ground and underground piping and components.

The inspectors reviewed program basis documents and implementing procedures to assess the effectiveness of the existing program. The inspectors reviewed the implementing procedures and results of periodic flow testing. The inspectors also conducted interviews and performed walkdown inspections of portions of the fire water system to evaluate the effectiveness of the existing program. Program enhancements were reviewed for adequacy and completeness.

For the Fire Water System Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

Nickel Alloy Inspection Program

The Nickel Alloy Inspection Program is an existing program that manages aging effects of alloy 600 components and alloy 82/182 welds in the reactor coolant system that are not addressed by the Reactor Vessel Head Penetration Inspection Program or the Steam Generator Integrity Program. The aging effect managed by this program, for nickel alloys exposed to borated water at an elevated temperature, is primary water stress corrosion cracking. The Nickel Alloy Inspection Program is a hybrid program containing elements of the Inservice Inspection Program, the Boric Acid Corrosion Control Program, and the Water Chemistry Control - Primary and Secondary Program. Nickel alloy degradation also is currently the subject of NRC Orders, Bulletins and Generic Letters and NRC-accepted industry guidelines, which form an integral part of the program implementation at Indian Point.

The inspectors reviewed Entergy's implementation of NRC Orders, Bulletins, and Generic Letters that form the basis for the Nickel Alloy Inspection Program. Entergy credits the Water Chemistry Control - Primary and Secondary Program for minimizing the potential for primary water stress corrosion cracking in susceptible materials by maintaining an environment that is less conducive to initiating primary water stress corrosion cracking. The Nickel Alloy Inspection Program detects degradation by using the examination and inspection requirements of ASME Section XI, augmented in response to NRC Orders, Bulletins and Generic Letters, or by the use of NRC-accepted industry guidelines. The Nickel Alloy Inspection Program detects cracking due to primary water stress corrosion cracking prior to loss of intended function.

The inspectors reviewed the current Electric Power Research Institute (EPRI) Materials Reliability Program being developed to manage and mitigate primary water stress corrosion cracking of nickel based alloy components. The main goal of this program will be to provide short and long term guidance for inspection, evaluation, and management of nickel alloy material and weld metal locations in pressurized water reactor primary systems. Guidance developed by the Materials Reliability Program will be used by Entergy to identify critical locations for inspection and augment existing inservice inspections. This program and the implementation of NRC Orders, Bulletins and Generic Letters are the subject of a separate inspection by the NRC: Temporary Instruction 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds".

For the Nickel Alloy Inspection Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

<u>One-Time Inspection Small Bore Piping Program</u>

The One-Time Inspection Small Bore Piping Program is a new program credited with managing the aging effects of cracking in small bore ASME Code Class 1 piping less than 4 inches nominal pipe size (NPS 4"), which includes pipe, fittings, and branch connections. The ASME Code does not require volumetric examination of Class 1 small bore piping.

The program will include a sample selected based on susceptibility, ability to inspect, dose considerations, operating experience, and limiting locations of the total population of ASME Code Class 1 small bore piping locations. When evidence of an aging effect is revealed by a one-time inspection, evaluation of the inspection results will identify appropriate corrective actions. Entergy states in its application that the inspections will be performed prior to the period of extended operation.

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 Code Class I Small-Bore Piping, which is based on industry operating experience. The program will use EPRI Report 1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)," January 2001, to determine which piping

less than 4" nominal pipe size is susceptible to potential effects of thermal stratification or turbulent penetration.

At the time of the inspection, Entergy had not completed many of the actions identified in the program. Therefore, the inspectors were unable to assess the effectiveness of the program's implementation.

For the One-Time Inspection Small Bore Piping Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. In program-level documents, Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

Steam Generator Integrity Program

The Steam Generator Integrity Program is an existing program and includes processes for monitoring and maintaining secondary side component integrity, including steam generator tubes. Steam generator tubes, in general, have experienced aging caused by corrosion, including primary water stress corrosion cracking, outside diameter stress corrosion cracking, intergranular attack, pitting, and wastage. Steam generator tubes have also experienced mechanically-induced aging, such as denting, wear, impingement damage, and fatigue. Nondestructive examination techniques, such as eddy current testing, are used to identify tubes that are defective and need to be removed from service or repaired.

The Steam Generator Integrity Program is implemented in accordance with NRC-approved guidance in NEI 97-06, "Steam Generator Program Guidelines," and is monitored by the NRC during every outage of each unit, using Inspection Procedure 71111.08, "ISI Inspection." The inspectors had previously reviewed the eddy current evaluations of tubes, the criteria used to determine if plugging was required, and assessed the effectiveness of measures to mitigate degradation. The inspectors have reviewed implementation regarding leakage monitoring, tube inspection scope and frequency, plugging and repair criteria, and steam generator degradation management. The inspectors reviewed the most recent Condition Monitoring and Operational Assessment Reports for each unit to ascertain the current state of the generators. The inspectors noted Unit 2 generators were replaced in December of 2000 with a W Model 44F Westinghouse design and the unit was uprated in November 2004. The inspectors also noted the original Unit 3 generators were replaced in 1989 and underwent an uprate in April of 2005.

For the Steam Generator Integrity Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

Non-Environmentally Qualified Inaccessible Medium-Voltage Cable Program

The Non-Environmentally Qualified (non-EQ) Inaccessible Medium-Voltage Cable Program is a new program that Entergy will implement prior to the period of extended operation. The program will be comparable to that described in NUREG-1801, Section XI.E3, "Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements." This program applies to inaccessible (e.g., in conduit or direct-buried) medium-voltage cables within the scope of license renewal that are exposed to significant moisture simultaneously with applied voltage. This program includes a commitment to test these cables at least once every 10 years to provide an indication of the condition of the conductor insulation. The specific type of test performed will be determined and implemented prior to the expiration of the current license. The program also includes inspections for water accumulation in manholes at least once every two years.

At the time of the inspection, Entergy had not completed many of the actions identified in the program. Therefore, the inspectors were unable to assess the effectiveness of the implementation of this program. The inspectors reviewed program documentation, condition reports, aging management review documents, and existing procedures, and confirmed that Entergy had a commitment in place to enhance the program prior to the period of extended operation. The inspectors also interviewed the engineer responsible for the non-EQ inaccessible medium-voltage cable program regarding implementation of particular test procedures to be developed under the program. The inspectors verified that Entergy had performed adequate historical reviews of plant specific and industry experience to determine aging effects.

Due to work control and planning constraints, Entergy was unable to open a manhole for inspection during the inspection period. On June 2, 2008, the inspectors returned and observed a scheduled quarterly preventive maintenance (PM) activity to open and inspect Unit 3 manhole 36. The inspectors observed standing water with several cable splices submerged. There were two 6.9 kV cables in the manhole, both associated with the station blackout/fire protection diesel generator. Entergy pumped the water out of the manhole, and assessed the condition of the cable jackets and splices as acceptable. In addition, the inspectors reviewed the results of previous quarterly PMs, and noted that water was typically found at a depth sufficient to submerge at least the lower cable splices. These inspection results regarding manhole environmental conditions are under evaluation by the NRC Office of Nuclear Reactor Regulation (NRR).

For the Non-EQ Inaccessible Medium-Voltage Cable Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. In program-level documents, Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

Environmental Qualification of Electric Components Program

The Environmental Qualification of Electric Components Program is an existing program, which is based on the program described in NUREG-1801, Section X.E1,

"Environmental Qualification (EQ) of Electric Components." This program manages component thermal, radiation, and cyclical aging through the use of aging evaluations based on 10 CFR 50.49(f) qualification methods. As required by 10 CFR 50.49, EQ components not qualified for the current license term are to be refurbished or replaced, or have their qualification extended prior to reaching the aging limits established in the evaluation. Aging evaluations for EQ components that specify a qualification of at least 40 years are considered time-limited aging analyses for license renewal.

The inspectors reviewed program documentation, condition reports, aging management review documents and existing procedures to evaluate the capability of the program to manage aging effects of EQ electric components. The inspectors also interviewed the engineer responsible for the EQ program, and reviewed internal and external assessments of the EQ program. The inspectors verified that Entergy had performed adequate historical reviews of plant specific and industry experience to determine aging effects.

For the Environmental Qualification of Electric Components Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure aging effects will be appropriately identified and addressed.

Aboveground Steel Tanks Program

The Aboveground Steel Tanks Program is an existing program credited with managing the loss of material from external surfaces of aboveground carbon steel tanks. The aging effects are managed by periodic visual inspections of external surfaces and thickness measurements of locations that are inaccessible for external visual inspection.

The inspectors reviewed program basis documents, plant procedures, and recent aboveground tank inspection results, and interviewed personnel. The inspectors also performed walkdown inspections of the Unit 2 and 3 condensate storage tanks, Unit 2 diesel fire pump water storage tank, and Unit 3 fire water storage tanks.

For the Aboveground Steel Tanks Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure aging effects will be appropriately identified and addressed.

Metal-Enclosed Bus Inspection Program

The Metal-Enclosed Bus Inspection Program is an existing program credited with managing the aging effects on non-segregated phase bus. The aging effects are managed by visually inspecting the enclosure assemblies and interior portions of the bus for structural integrity, signs of cracking, corrosion, water intrusion, excessive dust buildup, or foreign debris.

The inspectors reviewed drawings, reviewed completed maintenance documents, and performed walkdown inspections to evaluate the capability of the program to manage aging effects. The inspectors also had discussions with plant personnel regarding the program and the current conditions of the non-segregated bus.

The inspectors questioned the completeness of acceptance criteria for the internal inspection portion of the program. Entergy stated that the inspection procedures would be revised to include more complete acceptance criteria and the License Renewal Application (LRA) would be amended. The LRA was subsequently amended in LRA Amendment 3 dated March 24, 2008.

The inspectors also noted that the program operating experience review did not identify a 2004 example in which a bus connection was found less than hand tight and declared inoperable. Entergy agreed to revise the operating experience review report to include this example.

For the Metal Enclosed Bus Inspection Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance, as amended, to ensure aging effects are appropriately identified and addressed.

Non-EQ Bolted Cable Connections Program

The Non-EQ Bolted Cable Connections Program is a new program credited with managing the aging effects in bolted cable connections. The purpose of the program is to inspect bolted cable connections for loosening of the connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, or oxidation. The aging effects are managed by a one-time inspection of a representative sample of in-scope connections.

The inspectors reviewed program documents, and had discussions with plant personnel to assess the proposed program and its capability to manage aging effects. The inspectors noted that the existing program document allowed visual inspection of the connections, an approach which is not endorsed in the draft interim staff guidance, LR-ISG-2007-02 (Changes to Generic Aging Lesson Learned Report Aging Management Program XI.E6, “Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements”). Entergy stated that the inspection method would be revised to comply with the final interim staff guidance, when issued, and the LRA would be amended. The LRA was subsequently amended in LRA Amendment 3 dated March 24, 2008.

For the Non-EQ Insulated Cables and Connections Program, the inspectors concluded that Entergy performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. In program-level documents, Entergy provided adequate guidance, as amended, to ensure aging effects are appropriately identified and addressed.

Non-EQ Instrumentation Circuits Test Review Program

The Non-EQ Instrumentation Circuits Test Review Program is a new program credited with managing the aging effects in instrument cables exposed to adverse localized equipment environments. The aging effects are managed by a periodic review of instrumentation circuit calibration or surveillance results for in-scope components. Also, cable testing on in-scope cables will be performed for cables that are disconnected during the associated instrument calibration.

At the time of the inspection, Entergy had not completed many of the actions identified in the program. Therefore, the inspectors were unable to assess the effectiveness of the implementation of this program. However, the inspectors interviewed plant personnel, reviewed completed calibration results, and reviewed program documentation to assess the capability of the proposed program to manage aging effects.

For the Non-EQ Instrumentation Circuits Test Review Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. In program-level documents, Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

Non-EQ Insulated Cables and Connections Program

The Non-EQ Insulated Cables and Connections Program is a new program credited with managing the aging effects in insulated cables and connections exposed to adverse localized environments caused by heat, radiation, and moisture. The aging effects are managed by periodic visual inspections of a representative sample of in-scope cables and connections for jacket surface anomalies.

At the time of the inspection, Entergy had not completed many of the actions identified in the program. Therefore, the inspectors were unable to assess the effectiveness of the implementation of this program. The inspectors performed walkdown inspections, and had discussions with plant personnel to assess the proposed program and its capability to manage aging effects. The inspectors reviewed EPRI TR-109619, “Guideline for the Management of Adverse Localized Equipment Environments,” the guidance document that will be used to develop the program procedures. The inspectors noted that the aging management review for electrical cables did not include the transite (fibrous cement board) material used between cable trays for cable separation purposes. Entergy agreed to revise the aging management review to address transite.

For the Non-EQ Insulated Cables and Connections Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. In program-level documents, Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

Buried Piping and Tanks Inspection Program

The Buried Piping and Tanks Inspection Program is a new program credited with managing the effects of external corrosion on the pressure-retaining capability of buried carbon steel, gray cast iron, and stainless steel piping components and tanks in a soil environment. The aging effects will be managed by preventive measures (i.e., coatings and wrappings) to mitigate corrosion and by visual inspections during planned excavations. The program will be implemented by performing at least one inspection within the 10 year period prior to the period of extended operation, either during an excavation for other purposes or during an excavation planned for this inspection. An additional inspection will also be performed during the first 10 years of extended operation. The program will provide inspection and acceptance criteria, and will require evaluation of the inspection results. Inspections will be performed in accordance with approved station procedures.

At the time of the inspection, Entergy had not completed many of the actions identified in the program. Therefore, the inspectors were unable to assess the effectiveness of the implementation of this program. The inspectors reviewed the program basis document, including proposed scope, parameters to be monitored, method of monitoring, and acceptance criteria, and system drawings, and interviewed the responsible plant personnel regarding these documents and inspection criteria to be used. In addition, the inspectors reviewed EN-DC-343, Entergy Buried Piping and Tanks Inspection and Monitoring Program, which was an existing Entergy corporate level program not yet approved for implementation at Indian Point. The inspectors also performed field walkdown inspections of portions of the service water, auxiliary feedwater, and diesel fuel oil systems in the vicinity of buried piping to independently assess the material conditions and identify inconsistencies between the as-built plant configuration, and the aging management evaluations and programs.

Entergy reviewed condition reports written in the last 5 years to identify whether any in-scope buried piping component or tank inspections had been performed during excavations performed for other reasons. The review did not identify any issues (i.e., surface corrosion, damaged coating) associated with in-scope buried components. Entergy did identify several recent instances where buried piping had been excavated to perform internal piping inspections, or to fix through-wall leaks due to internal corrosion. In those instances, no formal inspection had been performed or documented, but engineering and maintenance personnel involved with the excavations stated that the external pipe coatings appeared to be in good condition. Therefore, Entergy concluded there had been no significant degradation or failures of the existing protective coatings on buried piping or tanks.

For the Buried Piping and Tanks Inspection Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. In program-level documents, Entergy provided adequate guidance to ensure the aging effects are appropriately identified and addressed.

Service Water Integrity Program

The Service Water Integrity Program is an existing program credited with managing the maintenance of internal protective coatings and piping, as well as the prevention of excessive macro-fouling and biofouling, associated with the open cycle service water system. The aging effects of material loss (corrosion) and fouling are managed by a condition and performance monitoring program (e.g., visual inspections and/or non-destructive examinations), and control techniques (e.g., chemical treatment), as recommended by NRC Generic Letter 89-13. The program includes piping and components in the service water system, emergency diesel generator system, component cooling water system, containment cooling and filtration systems, various in-scope nonsafety-related systems (i.e., instrument air), and the main control room heating, ventilation and air conditioning system.

The inspectors reviewed the existing program, associated procedures, trending reports, heat exchanger inspection records, eddy current examination results and trending reports, heat exchanger tube plugging trends, buried piping internal inspection records, intake structure inspection records, service water piping through-wall leakage logs, and service water system health reports to evaluate the effectiveness of the existing program. The inspectors interviewed the service water system engineer and the engineer responsible for the service water program, and performed field walkdown inspections to independently assess the material condition of the service water system, and identify inconsistencies between the as-built plant configuration and the aging management evaluations and programs.

The inspectors identified baffle racks in the Unit 3 intake structure, located immediately below the service water pump suctions, which had not been included in Entergy's aging management reviews. Entergy determined these components should have been within the scope of license renewal and committed to perform an aging management review, as required. Entergy preliminarily concluded these components would be managed by the Structures Monitoring Program and stated that the LRA would be amended. The LRA was subsequently amended in LRA Amendment 3 dated March 24, 2008.

For the Service Water Integrity Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance, as amended, to ensure aging effects are appropriately identified and addressed.

Heat Exchanger Monitoring Program

The Heat Exchanger Monitoring Program is an existing program, which will be enhanced to manage the aging effects of material loss (corrosion) for heat exchanger tubes, for those heat exchangers within the scope of license renewal that are not covered by other existing periodic monitoring programs. The aging effects will be managed by periodic visual inspections and non-destructive examinations. The enhancements will add additional heat exchangers, within the scope of license renewal, to the existing program and revise program procedures to (1) perform visual inspections when non-destructive examinations cannot be performed, (2) consider material environment combinations

when determining sample selections, and (3) specify acceptance criteria for visual inspections and minimum tube wall thickness.

The inspectors reviewed the existing program, heat exchanger inspection records, eddy current examination results and trending reports, and heat exchanger tube plugging trends to determine the effectiveness of the existing program. The inspectors interviewed the heat exchanger program engineer and selected maintenance personnel, performed field walkdown inspections, and observed portions of an on-going instrument air closed cooling water heat exchanger inspection to independently assess the material condition of selected heat exchangers, and identify inconsistencies between the as-built plant configuration and the aging management evaluations and programs.

The inspectors identified that the Unit 2 instrument air closed cooling water heat exchangers were included in an aging management review, but had been omitted from an implementing procedure with heat exchangers to be added into the heat exchanger monitoring program. Entergy agreed to add these heat exchangers to the program implementing procedures, which already included the similar heat exchangers from Unit 3.

For the Heat Exchanger Monitoring Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance, as revised, to ensure the aging effects are appropriately identified and addressed.

Water Chemistry Control - Closed Cooling Water Program

The Water Chemistry Control - Closed Cooling Water Program is an existing program, which will be enhanced to manage the aging effects of material loss (corrosion), cracking, and fouling for piping components and heat exchangers in closed cooling water systems. The aging effects are managed by monitoring and controlling water chemistry to minimize contaminant concentration and mitigate loss of material. The enhancements will add additional closed cooling water systems into the existing water chemistry program and revise the program procedures to monitor the appropriate chemistry parameters. The added systems include the Unit 2 station blackout diesel, and the Unit 2 and Unit 3 security generators.

The inspectors reviewed the existing water chemistry program and the associated chemistry procedures, and interviewed water chemistry specialists to evaluate the effectiveness of the existing program. In addition, the inspectors performed field walkdown inspections and observed portions of an on-going instrument air closed cooling water heat exchanger inspection to independently assess the material condition of selected closed cooling water systems, and identify inconsistencies between the as-built plant configuration and the aging management evaluations and programs.

The inspectors identified that (1) neither the existing procedures nor the specified enhancements included monitoring glycol within specified limits for the Unit 2 and Unit 3 security generators, and (2) the Unit 2 and Unit 3 fire protection diesels had not been included in the closed cooling water systems to be added to the existing program.

Entergy stated that the proposed enhancements would be revised to include these items and the LRA would be amended. The LRA was subsequently amended in LRA Amendment 3 dated March 24, 2008.

The inspectors identified that the reactor coolant pump motor lube oil coolers (i.e., heat exchangers) had been incorrectly identified as short-lived components and screened out of license renewal scope without an aging management review. Entergy committed to perform an aging management review for these components. Entergy preliminarily concluded these components would be managed by the Water Chemistry Control - Closed Cooling Water Program and the Oil Analysis Program. This change was subsequently addressed in Entergy's response to NRC request for additional information (RAI) 2.3.0-2 dated March 24, 2008.

For the Water Chemistry Control - Closed Cooling Water Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance, as amended, to ensure the aging effects will be appropriately identified and addressed.

Diesel Fuel Monitoring Program

The Diesel Fuel Monitoring Program is an existing program, which will be enhanced to manage the aging affects of material loss (corrosion) and fouling in fuel oil systems. The aging effects are managed by a combination of periodic chemistry sampling and analysis, and periodic fuel oil tank cleaning and inspection. The enhancements will (1) add selected systems within the scope of license renewal that were not previously included in the existing monitoring program, (2) add periodic cleaning and inspection of fuel oil tanks, including thickness measurements of tank bottoms, and (3) revise fuel oil chemistry sampling frequency, sample location, and monitored parameters, in accordance with appropriate industry standards.

The inspectors reviewed the existing fuel oil monitoring program, associated chemistry procedures, and recent fuel oil analysis results to evaluate the effectiveness of the existing program. The inspectors reviewed tank inspection records to verify the results were within the acceptable range. In addition, the inspectors interviewed engineering and chemistry personnel, and performed field walkdown inspections of the diesel fuel oil storage tanks, emergency diesel generators, station blackout diesels, and the emergency fuel oil transfer trailer to independently assess the material condition of the fuel oil systems and identify inconsistencies between the as-built plant configuration, and the aging management evaluations and programs.

The inspectors identified that the Unit 2 security diesel fuel oil storage tank was not included in the program enhancement to perform fuel oil chemistry sampling. Entergy stated that the proposed enhancements would be revised to include this item and the LRA would be amended. The LRA was subsequently amended in LRA Amendment 3 dated March 24, 2008.

The inspectors identified that the existing procedure for fuel oil transfer using the emergency fuel oil transfer trailer did not specify a chemistry oil sample be taken at the tank bottom, and did not provide specific acceptance criteria as to when tank flushing would be required. Entergy stated that the transfer trailer procedure would be revised to sample and flush in accordance with the existing requirements for fuel oil receipt inspections and the LRA would be amended. The LRA was subsequently amended in LRA Amendment 3 dated March 24, 2008.

The inspectors identified that for the Unit 3 emergency diesel fuel oil storage tanks, the existing procedure for tank bottom verification relied on techniques which would not be capable of determining bottom thickness, and did not specify appropriate acceptance criteria. Entergy stated that the existing procedure would be revised to specify wall thickness measurement using appropriate techniques and include appropriate acceptance criteria, and the LRA would be amended. The LRA was subsequently amended in LRA Amendment 3 dated March 24, 2008.

For the Diesel Fuel Monitoring Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance, as amended, to ensure the aging effects will be appropriately identified and addressed.

Boric Acid Corrosion Prevention Program

The Boric Acid Corrosion Prevention Program is an existing program credited with managing the aging effects of structures and components that are susceptible to boric acid corrosion. The aging effects are managed by performing periodic visual inspections of systems containing borated water and adjacent structures, components, and supports for leakage, and implementing appropriate corrective actions.

The inspectors reviewed relevant license renewal program documents, implementing procedures, the boric acid leakage database, and corrective action program documents, and interviewed the boric acid coordinator. Additionally, the inspectors performed a walkdown inspection of the Unit 2 and Unit 3 safety injection pump rooms and containment spray pump rooms.

For the Boric Acid Corrosion Prevention Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine the appropriate aging effects. Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

External Surfaces Monitoring Program

The External Surfaces Monitoring Program is an existing program that will be enhanced for the purpose of aging management. The aging effects are managed by performing periodic visual inspections by system engineers of components subject to aging management. The program is also credited with managing loss of material from internal

surfaces for situations in which internal and external material and environment combinations are the same, such that external surface condition is representative of internal surface condition.

The inspectors reviewed relevant license renewal program documents, implementing procedures, system walkdown reports, and condition reports, and performed a walkdown inspection of the Unit 2 and Unit 3 safety injection pump rooms and residual heat removal pump rooms with the system engineer.

For the External Surfaces Monitoring Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine the appropriate aging effects. Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

Flow-Accelerated Corrosion Program

The Flow-Accelerated Corrosion Program is an existing program credited with managing the corrosion aging effects in all carbon steel and low alloy steel components in systems containing high-energy fluids carrying two-phase or single-phase high energy fluid greater than 2% of plant operating time. The aging effects are managed by performing non-destructive examinations (e.g., ultrasonic testing) to detect wall thinning and by predicting wear rates to support the proactive replacement of system piping. In addition, the program provides for the performance of follow-up inspections to confirm predictions and to determine the need for repairs or replacements, as necessary.

The inspectors reviewed relevant license renewal program documents, implementing procedures, calculations, past flow-accelerated corrosion reports, and condition reports generated during previous inspections. In addition, with the engineer responsible for the flow-accelerated corrosion program, the inspectors performed a walkdown inspection of past inspection points and scheduled inspection points to confirm the configuration matched the plant drawings.

For the Flow-Accelerated Corrosion Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine the appropriate aging effects. Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

Reactor Vessel Head Penetration Inspection Program

The Reactor Vessel Head Penetration Inspection Program is an existing program credited with managing the aging effect of primary water stress corrosion cracking (PWSCC) of nickel-based alloy reactor vessel head penetrations exposed to borated water. Entergy developed this program in response to NRC Order EA-03-009. The aging effects are managed by performing bare metal visual examinations of the external surfaces of the reactor vessel head and non-visual examinations on the underside of the head.

The inspectors reviewed relevant license renewal program documents, implementing procedures, calculations of effective degradation years, videos of past reactor vessel head inspections, and reports documenting the results of past reactor vessel head inspections. The inspectors also reviewed Entergy's written responses to NRC Bulletins and NRC Order EA-03-009, and interviewed the assistant outage manager regarding the reactor vessel head penetration program.

For the Reactor Vessel Head Penetration Inspection Program, the inspectors concluded that Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine the appropriate aging effects. Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

One-Time Inspection Program

The One-Time Inspection Program is a new aging management program intended to verify the effectiveness of other aging management programs, including Water Chemistry, Oil Analysis, and Diesel Fuel Monitoring Programs, by reviewing various aging effects for impact. Where corrosion resistant materials and/or non-corrosive environments exist, the One-Time Inspection Program is intended to verify that an aging management program is not needed during extended operations by confirming that aging effects are not occurring or are occurring in a manner that does not affect the safety function of systems, structures, and components. These verifications will be accomplished by non-destructive evaluation performed by qualified personnel using procedures and processes consistent with the ASME Boiler and Pressure Vessel Code and 10 CFR 50, Appendix B. The One-Time Inspection Program will be implemented prior to the period of extended operation.

At the time of the inspection, Entergy had not completed many of the actions identified in the program. Therefore, the inspectors were unable to assess the effectiveness of the implementation of this program. The inspectors reviewed the program description and implementing procedures, and discussed the planned activities with the responsible staff.

For the One-Time Inspection Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. In program-level documents, Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

Selective Leaching Program

The Selective Leaching Program is a new program that is credited with managing the aging of components made of cast iron, bronze, brass, and other alloys exposed to raw water, treated water, soil or other environments that may lead to selective leaching of material constituents. The program will include a one-time visual inspection and hardness measurement of selected components that may be susceptible to selective leaching to determine whether loss of material due to selective leaching is occurring, and whether the process will affect the ability of the components to perform their intended

function for the period of extended operation. The Selective Leaching Program will be implemented prior to the period of extended operation.

At the time of the inspection, Entergy had not completed many of the actions identified in the program. Therefore, the inspectors were unable to assess the effectiveness of the implementation of this program. The inspectors reviewed the program description and a listing of components covered by the program, and discussed the planned activities with the responsible staff. Also, the inspectors reviewed condition reports for some applicable components and visually examined the condition of these components.

The inspectors noted that the program description specified a "selected set" of components to be inspected but provided no details as to how the set would be determined. Subsequently, Entergy stated that the program description would be revised to base the sample selection on a 90% confidence that 90% of the component population has not experienced degradation, and the LRA would be amended. The LRA was subsequently amended in LRA Amendment 3 dated March 24, 2008.

For the Selective Leaching Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. In program-level documents, Entergy provided adequate guidance, as amended, to ensure aging effects are appropriately identified and addressed.

Bolting Integrity Program

The Bolting Integrity Program is an existing program which applies to the bolting and torquing practices for bolting on pressure retaining components, component supports, and structural joints. The program includes periodic inspections for signs of leakage due to cracking, loss of material, and loss of preload. The program has preventive measures to preclude or minimize loss of preload and cracking.

The inspectors reviewed program basis documents and plant procedures, and interviewed applicable personnel. The inspectors also performed walkdown inspections of various systems to evaluate the effectiveness of the existing program.

For the Bolting Integrity Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

Structural Monitoring Program

The Structural Monitoring Program is an existing program that will be enhanced for the purpose of aging management of structures and structural components. The program had been developed based on guidance in Regulatory Guide 1.160 Revision 2, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and NUMARC 93-01 Revision 2, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," to satisfy the requirements of the Maintenance Rule. The

scope of the program also includes condition monitoring of masonry walls and water-control structures. The program enhancements will expand the program to include additional structures and components (such as diesel generator foundations, fire pumphouses, water and oil storage tanks, manholes and duct banks, cable trays and supports, cranes, crane rails, gaskets, seismic joint filler, and roof elastomers) that are not monitored under the existing program but require monitoring during the period of extended operations. Also, guidance will be added to the program to perform an engineering evaluation of groundwater samples to assess the aggressiveness of groundwater to concrete on a periodic basis (at least once every five years).

Aging effects are managed by periodic visual inspections by qualified personnel to monitor structures and components for applicable aging effects. Specifically, concrete structures are inspected for loss of material, cracking, and changes in material properties. Steel components are inspected for loss of material due to corrosion. Masonry walls are inspected for cracking, and elastomers will be monitored for a change in material properties. Earthen structures associated with water-control structures will be inspected for loss of material and loss of form (such as subsidence, settlement, leaks, and bowing). Component supports will be inspected for loss of material, reduction or loss of isolation function, and reduction in anchor capacity due to local concrete degradation. Exposed surfaces of bolting are monitored for loss of material due to corrosion, loose nuts, missing bolts, or other indications of loss of pre-load.

The inspectors reviewed the program description, program basis documents, station procedures, and results of prior inspections, interviewed cognizant personnel, and visually examined accessible structural items, including reinforced concrete and structural steel members, components, and systems to assess the effectiveness of the current program.

The inspectors also reviewed station procedures, maintenance history, inspection findings and followup of inspection findings, and inspection schedules. Planned inspection frequency was every five (5) years for accessible areas. The program contained provisions for more frequent inspections to ensure that observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process.

For the Structural Monitoring Program, the inspectors concluded Entergy had conducted adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

Masonry Wall Program

The Masonry Wall Program is an existing program which will be enhanced to include the Unit 1 intake structure within the scope of the program due to potential effects on Unit 2 electrical equipment. The scope of the program includes all masonry walls that perform intended functions in accordance with 10 CFR 54.4 and were covered by IE Bulletin 80-11. Additionally, the program includes masonry walls covered by 10 CFR 50.48 (Fire Protection), radiation shielding, and walls with potential to affect safety-related

components. The program is credited with managing the aging effects in masonry walls by a program of inspection for deterioration on a frequency of 5 years to assure that the established evaluation basis for each masonry wall remains valid during the period of extended operation. If any crack or deterioration is found, the inspection frequency is to be increased to monitor and assess the cause and effect of the degradation. The inspectors reviewed the program description, program basis documents, station procedures, and results of prior inspections. The inspectors also interviewed cognizant personnel and performed a visual examination of accessible masonry walls to assess the effectiveness of the current program. The inspections are implemented through station procedures. A review of maintenance history indicated that any degradation (such as cracks) of masonry block walls was identified and addressed, providing evidence that the inspection program is effective in identifying and correcting deficiencies, so that walls continue to perform their intended function.

In response to IE Bulletin 80-11, “Masonry Wall Design," and Information Notice 87-67, “Lessons Learned from Regional Inspections of Licensee Actions in Response to IE Bulletin 80-11," various actions have been taken. Actions have included program enhancements, follow-up inspections to substantiate masonry wall analyses and classifications, and the development of procedures for tracking and recording changes to the walls. These actions have addressed all concerns raised by IE Bulletin 80-11 and Information Notice 87-67, namely unanalyzed conditions, improper assumptions, improper classification, and lack of procedural controls. The inspectors’ review of Indian Point operating experience demonstrated that the program has been effective in managing aging effects of masonry walls.

For the Masonry Wall Program, the inspectors concluded Entergy had performed adequate evaluations, including reviews of industry experience and plant history, to determine appropriate aging effects. Entergy provided adequate guidance to ensure aging effects are appropriately identified and addressed.

b.3 System Review

Auxiliary Feedwater System Review

The inspectors selected the auxiliary feedwater system for a focused review to determine whether the aging management programs were adequate to effectively manage aging effects related to this system. The aging effects requiring management for the auxiliary feedwater system are loss of material, cracking-fatigue, fouling, cracking, and loss of material due to wear. The following aging management programs are credited with managing aging effects of the auxiliary feedwater system: Aboveground Steel Tanks; Bolting Integrity; Buried Piping and Tanks Inspection, External Surfaces Monitoring; Flow-Accelerated Corrosion; Water Chemistry Control - Auxiliary Systems; and Water Chemistry Control - Primary and Secondary.

The inspectors interviewed the auxiliary feedwater system engineer, performed walkdown inspections, and reviewed various aging management program documents to verify that the existing programs credited with managing the effects of aging in the auxiliary feedwater system have been comprehensive and effective. (All programs

except Buried Piping and Tanks Inspection are existing programs.) Specifically, the inspectors evaluated the existing aging management programs by reviewing system health reports, condition reports, plant procedures, and NDE inspection reports.

For the auxiliary feedwater system, the inspectors concluded that the physical condition of the system and the results of tests and inspections of the various existing aging management programs demonstrated that aging effects on the auxiliary feedwater system have been appropriately identified and addressed. Also, the inspectors concluded that the auxiliary feedwater system was appropriately addressed within the applicable aging management programs.

Unit 2 Station Blackout/Appendix-R Diesel Generator (SBO/App-R DG) System Review

Entergy modified the facility, and placed the new Unit 2 SBO/App-R DG in-service on April 30, 2008. (See LRA Amendment 4 dated April 30, 2008, for additional information.) The inspectors performed a focused review to determine whether the scoping and proposed aging management programs were adequate to effectively manage aging effects of this system. The aging effects requiring management for the SBO/App-R DG system are loss of material, cracking-fatigue, fouling, cracking, and loss of material due to wear. The following aging management programs are credited with managing aging effects: Bolting Integrity; External Surfaces Monitoring; Oil Analysis; Periodic Surveillance and Preventive Maintenance; Water Chemistry Control – Closed Cooling Water; Heat Exchanger Monitoring; and Selective Leaching.

The inspectors interviewed the SBO/App-R DG system engineer, performed walkdown inspections, and reviewed various aging management program documents to verify that the programs credited with managing the effects of aging in the SBO/App-R DG system will be comprehensive and effective. Because the SBO/App-R DG system is new, with no operating experience, the inspectors evaluated the existing aging management programs by reviewing similar system and component health reports, condition reports, and NDE inspection reports.

For the SBO/App-R DG system, the inspectors concluded that for license renewal purposes Entergy had accurate scoping determinations for the system and its components. Also, the inspectors concluded that the SBO/App-R DG system was appropriately addressed within the applicable aging management programs and that these programs were capable of managing SBO/App-R DG system aging effects.

c. Overall Conclusions

Overall, the inspection results support a conclusion that the proposed activities will reasonably manage the effects of aging in the systems, structures, and components identified in the application and that the intended functions of these systems, structures, and components will be maintained in the period of extended operation. The inspection concluded that the documentation supporting the application was in an auditable and retrievable form.

40A6 Meetings, Including Exit Meeting

The inspectors presented the inspection results to Joe Pollock, Site Vice President; Fred Dacimo, Vice President, License Renewal; and members of their staffs in an exit meeting that was open for public observation on June 18, 2008, in Cortlandt Manor, NY. Entergy had no objections to the NRC observations and presented the status of Entergy actions to address the NRC observations. Slides from the exit meeting are located in ADAMS within package ML081850595, which addresses inspection-related documents, including NRC slides under ML081840487 and Entergy slides under ML082130530.

No proprietary information was provided to the inspectors during this inspection.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

F. Dacimo	Vice President, License Renewal
J. Pollock	Site Vice President
R. Ahrabli	Structural engineer
T. Beasly	System engineer
A. Bokhari	Design engineer
C. Caputo	License renewal team
J. Cottam	Fire protection programs engineer
A. Cox	License renewal team
J. Curry	License renewal project manager
R. Dolansky	Program engineer
D. Fronabarger	License renewal team
J. Goebel	Assistant outage manager
R. Herrmann	Program engineer
J. Hill	Design engineering, I&C supervisor
T. Ivy	License renewal team
L. Loubrano	Component engineer
W. Mahlmeister	Design engineer
I. Mew	Program engineer
D. Pennino,	Program engineer
J. Pinada	System engineer
C. Pistol	Program engineer
H. Robinson	System engineer
R. Rucker	License renewal team
D. Shah	System engineer
M. Stewart	Electrical maintenance
A. Taylor	License renewal team
M. Tesorioro	NSSS supervisor
J. Timone	Component engineer
J. Whitney	System engineer

LIST OF DOCUMENTS REVIEWED

License Renewal Application Drawings

Complete set, including four Unit 1, 73 Unit 2, and 60 Unit 3 drawings

Other Drawings

A202382, Conduit Details for Manholes 35 & 36, Rev 8

617F645, IP3 Main One Line Diagram, Rev 18
A208377-09, IP2 Main One Line Diagram, Rev 9
A250907-21, IP2 Electrical Distribution and Transmission System, Rev 21
9321-2018, Flow Diagram - Condensate & Boiler Feed Pump Suction
9321-2019, Flow Diagram - Boiler Feedwater
9321-F-2012, IP2 Intake Structure General Arrangement, Rev 5
9321-F-40573, IP3 Flow Diagram for Auxiliary Steam Supply and Condensate Return System, Rev 27
9321-F-51773, Pipe Trench Area – Restraint and Support Design, Rev 7
9321-L-60129, Sht 6, Restraint SA-H&R-505-U

License Renewal Program Basis Documents

IP-RPT-06-LRD01, System and Structure Scoping Results, Rev 0

IP-RPT-06-LRD02, Aging Management Program Evaluation Report, Rev 3:
Section 3.1, One-time Inspection – Small Bore Piping Program
Section 4.1, Nickel Alloy Inspection Program
Section 4.2, Fatigue Monitoring Program
Section 4.6, Reactor Vessel Head Penetration Inspection Program
Section 4.8, Steam Generator Integrity Program

IP-RPT-06-LRD05, Operating Experience Review Report, Rev 1

IP-RPT-06-LRD07, Aging Management Program Evaluation Report, Rev 3:
Section 3.1, Buried Piping and Tanks Inspection Program
Section 3.2, One-Time Inspection Program
Section 3.3, Selective Leaching Program
Section 4.1, Aboveground Steel Tanks Program
Section 4.2, Bolting Integrity Program
Section 4.4, Boric Acid Corrosion Prevention Program
Section 4.5, Diesel Fuel Monitoring Program
Section 4.6, External Surface Monitoring Program
Section 4.7, Fire Protection Program
Section 4.8, Fire Water System Program
Section 4.9, Flow Accelerated Corrosion Program
Section 4.12, Service Water Integrity Program
Section 4.15, Water Chemistry Control – Closed Cooling Water Program
Section 4.17, Heat Exchanger Monitoring Program

IP-RPT-06-LRD08, Aging Management Program Evaluation Report, Rev 3:
Section 3.2, Containment Inservice Inspection Program
Section 3.3, Structures Monitoring Program
Section 3.4, Masonry Wall Program

IP-RPT-06-LRD09, Aging Management Program Evaluation Report, Rev 3:
Section 3.1, Non-EQ Bolted Cable Connections Program
Section 3.2, Non-EQ Inaccessible Medium-Voltage Cable Program

Section 3.3, Non-EQ Instrumentation Circuits Test Review Program
Section 3.4, Non-EQ Insulated Cables and Connections Program
Section 4.1, Environmental Qualification (EQ) of Electric Components Program
Section 4.2, Metal Enclosed Bus Inspection Program

Aging Management Review Technical Basis Documents (all preceded by IP-RPT-06-)

AMC04, Aging Management Review of Bulk Commodities, Rev 1
AME01, Attachment 4, Inaccessible Medium-Voltage Cable Screening, Rev 0
AMM14, Aging Management Review of the Compressed Air Systems, Rev 0
AMM16, Aging Management Review of Fire Protection Water System, Rev 0
AMM20, Aging Management Review of IP2 SBO and Appendix R Diesel Generator System, Rev 0
AMM24, Aging Management Review of the Auxiliary Feedwater Systems
AMM30, Aging Management Review of the Nonsafety-related Systems and Components Affecting Safety-Related Systems, Rev 2 & Rev 3

Plant Procedures

EN-DC-147, Alloy 600 Program Plan, Rev 3
EN-DC-159, System Monitoring Program, Rev 2
EN-DC-178, System Walkdowns, Rev 1
EN-DC-315, Flow Accelerated Corrosion Program, Rev 0
EN-DC-317, Entergy Steam Generator Administrative Procedure, Rev 2
EN-DC-319, Inspection and Evaluation of Boric Acid Leaks, Rev 2
EN-DC-343, Entergy Buried Piping and Tanks Inspection & Monitoring Program, Rev 0
EN-LI-102, Corrective Action Process, Rev 8
EN-LI-102, Corrective Action Process, Rev 9
EN-MS-S-011-MULTI, Conduct of System Engineering, Rev 2
ENN-CS-S-008, Pipe Wall Thinning Structural Evaluation, Rev 1
ENN-DC-150, Condition Monitoring of Maintenance Rule Maintenance, Rev 2
ENN-EP-S-001, IWE General Visual Containment Inspection, Rev 0
ENN-EP-S-003, IWL Visual Containment Inspection, Rev 0
ENN-NDE-2.12, Certification of Visual Testing (VT) Personnel, Rev 2
ENN-NDE-9.05, Ultrasonic Thickness Examination, Rev 1
ENN-NDE-10.1, VT-1 Examination, Rev 3
0-MS-411, Rev 1 Torquing of Mechanical Fasteners
2-PT-R075, Rev 13 RCS Integrity Inspection
3-PT-R131, Rev 11 RCS Integrity Leak Test
Engineering Report IP-RPT-07-00093, Boric Acid Corrosion Control Program, Rev 0
HTX-006-IAC, Instrument Air Compressor Closed Cooling Water HX Maint., Rev 1
IP-SMM EV-103, Petroleum Bulk Storage Tank Program, Rev 0
PFM-116, Motor Monitoring Program Procedure, Rev 0
PT-EM19, Procedure for Testing Cable Spreading Room Halon System, Rev 10
SAO-703, Fire Protection Impairment Criteria and Surveillance, Rev 24
SEP-SW-001, Generic Letter 89-13 Service Water Program, Rev 1
0-CY-1500, Chemistry Sampling Locations, Rev 6
0-CY-1810, Diesel Fuel Oil Monitoring, Rev 5

0-CY-2510, Closed Cooling Water Chemistry Specifications and Frequencies, Rev 4
0-CY-2515, Adding Chemicals to Closed Cooling Systems, Rev 6
0-CY-3318, Water and Sediment in Fuel Oil, Rev 3
2-PI-Q001, Inspection Procedure for Fire Separation Barriers (Unit 2), Rev 8
2-PT-2Y015, Revision 1, Thermal Cycle Monitoring Program, Rev 0
2-PT-2Y017, Procedure for Penetration Fire Barrier Seal Inspections (Unit 2), Rev 0
2-PT-W005, Weekly Surveillance Procedure for Diesel Fire Pump (Unit 2), Rev 18
2-PT-M040, Procedure for Testing Diesel Fire Pump (Unit 2), Rev 23
2-PT-Q092, Containment Building Inspection, Rev 3
2-PT-R156, RCS Boric Acid Leakage and Corrosion Inspection, Rev 1
2-PT-R203, Visual Examination of Reactor Vessel Head Penetrations and Head Surface for Leakage, Rev 2
2-PT-R204, Visual Examination of Reactor Vessel Bottom Mounted Instrument Penetrations for Leakage, Rev 1
2-SOP 29.20, Emergency Fuel Oil Transfer Using the Trailer, Rev 0
3-CY-2615, Adding Chemicals to Auxiliary Systems, Rev 0
3-PT-M042B, Procedure for Testing Unit 3 Diesel Fire Pump, Rev 3
3-PT-M051, Revision 9, Plant Operation Information, Rev 2
3-PT-R100A, Procedure for Unit 3 Controlled Barrier Inspection, Rev 1
3-PT-R102, Procedure for Fire Barrier Wrap/Radiant Energy Shield Inspection, Rev 4
3-PT-2Y004, Unit 3 CO2 System Test for Cable Spreading & Switchgear Rooms, Rev 2
3-PT-Q137, Containment Building Inspection, Rev 4
3-PT-R203, Visual Examination of Reactor Vessel Head Penetrations and Head Surface for Leakage, Rev 2
3-PT-R204, Visual Examination of Reactor Vessel Bottom Mounted Instrument Penetrations for Leakage, Rev 1
3-PT-CS032B, Flow Test of SW Header Check Valve and Underground Portions of Line 408, Rev 9
2-RPT-00003, Containment Inservice Inspection Program First Containment Inspection Interval (09/09/96 - 05/09/08), Rev 1
3-RPT-UNSPEC-03499, IP 2&3 Eddy Current Program, Rev 1
IP-RPT-04-00206, Indian Point 2 Steam Generator Program, Rev 1
IP-RPT-04-01796, Indian Point 3 Steam Generator Program, Rev 7
IP-RPT-06-00055, Condition Monitoring and Operational Assessment of Indian Point 2 Steam Generator Tubing for Cycles 18 and 19, Rev 0
IP-RPT-07-00031, 3R14 Condition Monitoring and Operational Assessment of Indian Point 3 Steam Generators, Rev 0
IP3-RPT-VC-03071, Containment Inservice Inspection, First Ten Year Class MC and CC Program, 09/10/99-07/20/09, Rev 5

<u>System Health Reports</u>
IP3 Heat Exchangers, 2nd Quarter 2007
IP3 Service Water, 1st Quarter 2007
IP2 Auxiliary Feedwater, 1st Quarter 2007
IP2 Auxiliary Feedwater, 3rd Quarter 2007
IP3 Auxiliary Feedwater, 1st Quarter 2007
IP3 Auxiliary Feedwater, 3rd Quarter 2007
IP2 Cycle 18 Generic Letter 89-13 Leakage Logs

IP2&3 Service Water System Leakage History 1991 to Present, Dated Jan 2008
IP3 Cycle 15 Generic Letter 89-13 Leakage Logs

Condition Reports (CRs)

IP2-2000-04864
IP2-2000-07403
IP2-2001-07815
IP2-2002-03598
IP2-2003-02364
IP2-2004-05296
IP2-2004-05748
IP2-2005-02690
IP2-2006-01485
IP2-2006-01798
IP2-2006-01929
IP2-2006-01965
IP2-2006-02146
IP2-2006-02161
IP2-2006-02290
IP2-2006-02553
IP2-2006-02639
IP2-2006-02712
IP2-2006-02780
IP2-2007-03749
IP2-2008-00124
IP2-2008-00517*

IP3-1995-00044
IP3-2000-01898
IP3-2000-00561
IP3-2001-04270
IP3-2005-02634
IP3-2005-03202
IP3-2005-04563
iP3-2006-00583
IP3-2006-02270
IP3-2007-01388
IP3-2007-01399
IP3-2007-00309
IP3-2007-01852
IP3-2007-02984
IP3-2007-03497
IP3-2008-00285*
IP3-2008-00442*
IP3-2008-00444*
IP3-2008-00457*
IP3-2008-00517*

IP3-LO-2005-00117

*CRs written as a result of the NRC inspection

Maintenance Requests & Work Orders

WO IP2-02-32382
WO IP2-03-10707
WO IP2-04-14606
WO IP2-04-14609
WO IP2-06-01525
WO IP3-98-484002
WO IP3-02-20718
WO IP3-05-21828
WO IP3-05-19497
WO IP3-05-24529
WO IP3-06-13173
WO IP3-06-16430
WO IP2-02-48724
WO IP3-06-23446
WO IP3-06-23450

WO 51345229-01
WO 51434864

WR IP2-02-32987
WR IP2-02-60313
WR IP2-04-23003
WR IP3-02-22223
WR IP3-02-22224
WR IP3-03-19544
WR IP3-03-19545

I3-000261300
I3-000277700
I3-010166600
I3-980309200
I3-980309300
I3-990116600
IP2-01-21964
IP2-02-31080
IP2-02-31082
IP2-02-31084
IP2-02-31085
IP2-02-33308
IP2-03-21948
IP2-98-97215
IP3-02-16871

IP3-02-21957
IP3-02-21958
IP3-02-21984
IP3-02-22487
IP3-02-22488
NP-92-58250
NP-93-66966
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NP-98-97215

Completed Surveillance Tests
2-PC-2Y72A, Source Range Neutron Flux N-31 Channel Calibration, performed 4/19/06
2-PC-2Y72B, Source Range Neutron Flux N-32 Channel Calibration, performed 4/20/06
2-PC-2Y73A, Intermediate Range Neutron Flux N-35 Channel Calibration, performed 5/9/06
2-PC-2Y73B, Intermediate Range Neutron Flux N-36 Channel Calibration, performed 4/25/06
2-PC-4Y74B, Nuclear Instruments Power Range N-42 Channel Calibration, performed 5/5/06
2-PC-4Y74D, Nuclear Instruments Power Range N-44 Channel Calibration, performed 5/4/06
2-PC-R38-2, High Range Containment Area Radiation Monitor R25, performed 4/14/06, 5/16/06
2-PC-R38-4, High Range Containment Area Radiation Monitor R26, performed 5/6/06
2-PI-M009, Aboveground Petroleum Storage Tanks, Performed 1/16/08
3-PC-Q109A, Nuclear Power Range Channel N-41 Axial Offset Calibration, performed 5/31/07
3-PC-Q109B, Nuclear Power Range Channel N-42 Axial Offset Calibration, performed 5/31/07
3-PC-Q109C, Nuclear Power Range Channel N-43 Axial Offset Calibration, performed 6/1/07
3-PC-Q109D, Nuclear Power Range Channel N-44 Axial Offset Calibration, performed 6/1/07
3-PC-R45, Calibration Procedure for the Gamma-Metrics Excore Nuclear Instrumentation System, performed 3/25/05
3-PC-R46A, Containment High Range Radiation Monitor Calibration (R-25), performed 3/13/07
3-PC-R46B, Containment High Range Radiation Monitor Calibration (R-26), performed 3/13/07
3-PC-R72A, Nuclear Instruments Source Range N-31 Channel Calibration, performed 3/8/07
3-PC-R72B, Nuclear Instruments Source Range N-32 Channel Calibration, performed 3/8/07
3-PC-R73A, Nuclear Instruments Intermediate Range N-35 Channel Calibration, performed 3/10/07
3-PC-R73B, Nuclear Instruments Intermediate Range N-36 Channel Calibration, performed 3/10/07
EBD-B-002-N, Westinghouse 6.9KV Cubicle and Bus Cleaning and Inspections, performed 2/25/93, 7/14/94, 5/15/97, 11/2/04
EBD-P-004-A, Westinghouse Station Service Transformers and Buses (480VAC), performed 4/24/00, 11/8/02
ELC-013-BUS, Inspection, Cleaning, and Testing of Medium Voltage Switchgear, performed 9/17/99, 5/7/01, 4/9/03, 3/18/07, 3/21/07
ELC-014-BUS, Inspection, Cleaning, and Testing of 480V Load Center, performed 9/17/99, 4/8/03, 3/17/07
IP2-04-30541, High Range Containment Area Radiation Monitor 26, performed 3/24/06
PC-M-1, Nuclear Power Range Channels Axial Offset, performed 9/13/04
PI-SA-2, Atmospheric Tanks, Performed 9/7/07
2-PT-3Y009, Flow Test for underground SE Line 409, Completed 08-09-2005
2-PT-3Y010, Flow Test for underground SE Line 409, Completed 09-10-2005

3-PT-CS032A, Flow Test of SW Header Check Valve and Underground Portions of Line 408, Completed 03-28-2007
WR 51478836-01, Perform 3-PT-Q137, Rev 4, Containment Building Inspection
WR 51550475, Perform 2-PT-Q092, Rev 3, Containment Building Inspection
WR IP2-02-17652, Perform 2-PT-R203, Rev 0, Visual Examination of Reactor Vessel Head Penetrations and Head Surface for Leakage
WR IP3-06-10035, Perform 3-PT-R203, Rev 1, Visual Examination of Reactor Vessel Head Penetrations and Head Surface for Leakage
WR IP3-06-12801, Perform 3-PT-R204, Rev 0, Visual Examination of Reactor Vessel Bottom Mounted Penetrations for Leakage

Inspection Reports

IP3-UT-07-096
IP2-UT-07-053
IP2-UT-07-047
IP2-UT-07-043
IP2-UT-07-037

Maintenance Rule Inspections (Structural):

- Reactor Building: Twenty-three reports
- Turbine Building: Eight reports
- Emergency Diesel Generator and Associated Structures: Nine reports
- Radwaste Building: Four reports
- Miscellaneous Structures: Sixty reports

Visual Inspection Photographs

IP2 408 SWP:
408 header exc Nov 04, 021 – 10 photographs
IP2 buried flng to header by river - 3 photographs
IP2 SWP 408 buried flng to PAB Bldg – 4 photographs
IP2 SWP 24/25/26 408 – 5 photographs
1st tee @ 30' – 4 photographs
Upper 90 vert elbow – 1 photographs

IP2 414 HDR:
Debris @10' east of access - 1 photograph
Debris @15' east of access – 1 photograph

IP2 840 Vlv:
840 flng – 1 photograph
1103 pipe connection to main from swn 46 – 1 photograph
1105 left side close up - 1 photograph
1105 right side close up – 1 photograph
1105 upstream – 4 photographs
Flow restrictor – 1 photographs

Main Pipe to 1103 (SWN45) connection – 1 photograph
Tee crotch near 840 – 1 photograph
Weld @ tee down stream of 1105 (2) – 1 photograph
Weld @ tee down stream of 1105 left side – 1 photograph
Weld @ tee down stream of 1105 right side – 1 photograph
Weld @ tee downstream (4) – 1 photograph
Weld @ tee downstream of 1105 (3) – 1 photograph

Excavation of flange 408 – 12 pictures

SWN 40:
2nd Reducer from access – 1 photograph
Debris @ Vert 90 elbow – 3 photographs

Photos of Reactor Vessel Head Cleaning from 2R16
Photos of Reactor Vessel Head Cleaning from 2R17

Miscellaneous Documents
IP2-DBD-222, Electrical Separation Design Basis Document, Rev 2
Letter No. 20407.002, from Normandeau Associates, to IP3, Zebra Mussel Monitoring Program June Results, dated 06-22-2007
Letter from Hunting Pipeline Services, to IP3, Evaluation of As-found Condition of SW Mechanical Seals, dated 03-17-2005
2R17 Flow Accelerated Corrosion Monitoring Program, Spring 2006
3R14 FAC Examination Report for Indian Point Unit 2 for Entergy Nuclear, March 2007
IP-RPT-05-00407, IPEC 3R14 FAC Scope Review, Rev 0
IP-RPT-06-00070, Alloy 600 Program Plan, Rev 0
IP-RPT-MULT-03162, Unit 3 Flow-Accelerated Corrosion Susceptibility Review and Small-Bore and Augmented Monitoring Program, Rev 2
IP2 Boric Acid Database
IP2 Flow Accelerated Corrosion Program Plan Supplement, April 28, 2003
IP2 Reactor Vessel Examination, Examination Summary dated May 5, 2006
IP3 Boric Acid Database
ER IP2-06-26282, Flow Accelerated Corrosion Inspection Points for 2R18, Rev 0
ER IP3-05-24045, Flow Accelerated Corrosion Inspection Points for 3R14, Rev 1
IP2-02-50626, Reactor Vessel Head Penetration Contingency Repair
Maintenance Rule Basis Document for Structures
Monitoring Reports for 10CFR50.65 Maintenance Rule Structures
A02-07I, 12/23/2003, QA Audit Report on EQ Program.
A03-12-I, 10/21/2003, Fire Protection Program Audit
GT-1 North & South Fuel Oil Storage Tanks Inspection Report, Dated June 2001
GT-2/3 Fuel Oil Storage Tank Inspection Report, Dated April 2002
IP-2 Service Water Intake Pump Bay Silt Mapping Report, Dated 05-04-2007
IP-2 Service Water Intake Pump Bay Silt Mapping Report, Dated 11-28-2007
IP-2 Remote Visual Inspection of Service Water Piping Report, Dated 11-10-2004
QA-09-2005-IP-1, 12/12/2005, IPEC Fire Protection Program Audit.
QA-09-2006-IP-1, 01/19/2006, IPEC Fire Protection Program Audit.
IPEC Self Assessment Report - Leak Management Program Implementation

Listing of Components Covered by Selective Leaching Program
Email from Charles Caputo on August 14, 2006; Results from site walkdown of the chlorination system for IP2 and IP3
WCAP-12191, Transient and Fatigue Cycle Monitoring Program Transient History Evaluation Final Report for Indian Point Unit 2, July 1999, Rev 2
WCAP-12937, Structural Evaluation of Indian Point Units 2 and 3 Pressurizer Surge Lines, Considering the Effects of Thermal Stratification, May 1991

Calculations
FCX-00538, Estimation of EDYs for IP2 Reactor Vessel Head by 2R17 and 2R18
IP-CALC-04-01634, Assessment of the Impact of Power Uprate on the EOL Degradation Years (EDY's) for the IP3 Vessel Head, Rev 0
IP-CALC-06-00100, Wall Thinning Evaluation for Flow Accelerated Corrosion at 2R17 Locations, Rev 0
IP-CALC-06-00175, Evaluation of FAC Inspection Point LPFW22B-1N for Local Wall Thinning, Rev 0
IP-CALC-06-00297, Wall Thinning Evaluation and R.S.L. for Flow Accelerated Corrosion at 2R17 Locations, Rev 0
IP3-CALC-RV-03720, Estimation of Effective Degradation Years (EDY) for IP3 Reactor Vessel Head, Rev 2

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Indian Point Unit 2, Response to NRC Bulletin No. 87-01, Thinning of Pipe Walls in Nuclear Power Plants, September 11, 1987
IP3-87-055Z, Indian Point 3. NRC Bulletin No. 87-01 Thinning of Pipe Walls in Nuclear Power Plants, September 15, 1987
IPN-89-044, Indian Point 3 Nuclear Power Plant Response to NRC Generic Letter 89-08, Erosion/Corrosion - Induced Pipe Wall Thinning, July 21, 1989
Letter from Entergy to NRC dated March 11, 2004, Indian Point 2 and 3 Answer to 2/20/04 Revised NRC Order Regarding Interim Inspection Requirements for Reactor Pressure Vessel Heads
Letter from Entergy to NRC dated March 27, 2003, IP3 NRC Order EA-03-009 Relaxation Request Regarding Inspection of Reactor Pressure Vessel Head Nozzles
Letter from NRC to Entergy dated October 15, 2004, Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Unit Number 2
NL-05-001, Letter from Entergy to NRC dated January 17, 2005, Reactor Vessel Head Inspection Results: IP2, Fall 2004 Refueling Outage (2R16)
NL-05-044, Letter from Entergy to NRC dated May 31, 2005, Reactor Vessel Head Inspection Results: IP3, Spring 2005 Refueling Outage (3R13)
NL-06-028, Letter from Entergy to NRC dated May 31, 2006, License Amendment Request for Adoption of TSTF-449, Regarding Steam Generator Tube Integrity
NRC Letter to Entergy Nuclear Operations, Inc. August 18, 2005
Entergy Nuclear Northeast Letter to NRC, NL-05-002, January 17, 2005
Entergy Nuclear Northeast Letter to NRC, NL-05-063, May 31, 2005

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BL 2002-02, Reactor Pressure Vessel Head And Vessel Head Penetration Nozzle Inspection Programs, August 9, 2002
BL 2003-02, Leakage From Reactor Pressure Vessel Lower Head Penetrations And Reactor Coolant Pressure Boundary Integrity, August 21, 2003
EA-03-009, Issuance Of Order Establishing Interim Inspection Requirements For Reactor Pressure Vessel Heads At Pressurized Water Reactors, February 11, 2003
EA-03-009, Issuance Of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements For Reactor Pressure Vessel Heads At Pressurized Water Reactors, February 20, 2004
GL 88-05, Boric Acid Corrosion Of Carbon Steel Reactor Pressure Boundary Components In Pwr Plants (Generic Letter 88-05), March 17, 1988
GL 89-13, Service Water System Problems Affecting Safety-related Equipment
IN 2002-11, Recent Experience With Degradation Of Reactor Pressure Vessel Head, March 12, 2002
IN 2002-13, Possible Indicators Of Ongoing Reactor Pressure Vessel Head Degradation, April 4, 2002
IN 2003-02, Recent Experience With Reactor Coolant System Leakage And Boric Acid Corrosion, January 16, 2003
IN 86-108, Degradation Of Reactor Coolant System Pressure Boundary Resulting From Boric Acid Corrosion, December 29, 1986
NUREG-1801, Generic Aging Lessons Learned (GALL) Report, Rev 1
RIS 2003-13, NRC Review Of Responses To Bulletin 2002-01, “Reactor Pressure Vessel Head Degradation And Reactor Coolant Pressure Boundary Integrity”

Industry Documents

EPRI TR 1042135 Bolted Joint Maintenance & Applications Guide
EPRI TR-107396, Closed Cooling Water Chemistry Guideline, Rev 1
EPRI TR-107514, Age-Related Degradation Inspection Method and Demonstration
EPRI Report 10000701, Interim Thermal Fatigue Management Guideline (MRP-24), January 2001
NEI 95-10, Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 – The License Renewal Rule, Rev 6
NSAC-202L-R3, Recommendations for an Effective Flow-Accelerated Corrosion Program, May 2006
United Engineers & Constructions Inc. Specification No. 9321-01-248-18

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ASME	American Society of Mechanical Engineers
CR	Condition Report
DRS	Division of Reactor Safety
EPRI	Electric Power Research Institute
EQ	Environmental qualification, i.e., 10 CFR 50.49
IE	Office of Inspection & Enforcement, NRC
ISG	Interim Staff Guidance
ISI	Inservice Inspection
LRA	License Renewal Application
NEI	Nuclear Energy Institute
NPS	normal pipe size
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation, NRC
PARS	Publicly Available Records
PM	preventive maintenance
PWSCC	primary water stress corrosion cracking