



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 21, 2015

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

SUBJECT: PLAN FOR THE REGULATORY AUDIT OF THE SERVICE WATER INTEGRITY
AND FIRE WATER SYSTEM AGING MANAGEMENT PROGRAMS
PERTAINING TO THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2
AND 3 LICENSE RENEWAL APPLICATION (CAC NOS. MD5407 AND MD5408)

Dear Sir or Madam:

By letter dated April 23, 2007, as supplemented by letters dated May 3, 2007, and June 21, 2007, Entergy Nuclear Operations, Inc. (Entergy), submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to the U.S. Nuclear Regulatory Commission (NRC) for renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3). The NRC staff documented its findings in the Safety Evaluation Report (SER) related to the license renewal of IP2 and IP3, which was issued August 11, 2009 and supplemented August 30, 2011 (SER Supplement 1), and November 6, 2014 (SER Supplement 2). Subsequent the issuance of SER Supplement 1, the NRC staff identified additional operating experience at several nuclear power plants regarding recurring internal corrosion, corrosion occurring under insulation, and managing aging effects for fire water system components. To address this operating experience, on November 22, 2013, the NRC staff issued interim staff guidance document LR-ISG-2012-02, "Aging Management of Internal Surfaces, Fire Water Systems, Atmospheric Storage Tanks, and Corrosion Under Insulation."

In accordance with the enclosed audit plan, the NRC staff plans to conduct an onsite audit of the service water integrity and fire water system aging management programs during the week of February 22, 2016. If you have any questions, please contact me by telephone at 301-415-6459, or by e-mail at michael.wentzel@nrc.gov.

Sincerely,

/RA/
Michael J. Wentzel, Project Manager
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosure:
As stated

cc w/encl: Listserv

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Docket Nos. 50-247 and 50-286
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ADAMS Accession No.: ML15327A213

*concurrence via email

OFFICE	LA:DLR*	PM:RPB2:DLR	BC:RARB:DLR	BC:RPB1:DLR	PM:RPB2:DLR
NAME	IBetts	MWentzel	DMorey	YDiaz	MWentzel
DATE	11/24/15	11/24/15	12/16/15	12/18/15	12/21/15

OFFICIAL RECORD COPY

Letter to Vice President, Operations, Entergy from M. Wentzel dated December 21, 2015.

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Audit Plan

Service Water Integrity and Fire Water System Aging Management Program Review for the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application

February 23-25, 2016

**Division of License Renewal
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission**

ENCLOSURE

**Service Water Integrity and Fire Water System
Aging Management Program Audit Plan
Indian Point Nuclear Generating Unit Nos. 2 and 3**

1. Background

By letter dated April 23, 2007, as supplemented by letters dated May 3, 2007, and June 21, 2007, Entergy Nuclear Operations, Inc. (Entergy), submitted an application pursuant to Title 10 of the Code of Federal Regulations Part 54 the U.S. Nuclear Regulatory Commission (NRC) for renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3). The NRC staff documented its findings in the Safety Evaluation Report (SER) related to the license renewal of IP2 and IP3, which was issued August 11, 2009, and supplemented August 30, 2011 (SER Supplement 1), and November 6, 2014 (SER Supplement 2).

Subsequent the issuance of SER Supplement 1, the NRC staff identified additional operating experience at several nuclear power plants regarding recurring internal corrosion, corrosion occurring under insulation, and managing aging effects for fire water system (FWS) components. To address this operating experience, on November 22, 2013, the NRC staff issued interim staff guidance document LR-ISG-2012-02, "Aging Management of Internal Surfaces, Fire Water Systems, Atmospheric Storage Tanks, and Corrosion Under Insulation."

The NRC staff from the Division of License Renewal will lead a supplemental regulatory audit to gain a better understanding of Entergy's responses to requests for additional information (RAIs) related to LR-ISG-2012-02, submitted by letters dated December 16, 2014, and August 18, 2015 (ADAMS Accession Nos. ML14365A069 and ML15236A017, respectively). The audit will cover the aging management programs (AMPs) for managing recurring internal corrosion in the service water integrity (SWI) and FWS, as well as aging effects managed by the Fire Water System Program described in license renewal application (LRA) B.1.14.

2. Regulatory Audit Bases

License renewal requirements are specified in Title 10 of the *Code of Federal Regulations* (CFR), Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." Guidance is provided in NUREG-1800, Rev. 2, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), dated December 2010, NUREG-1801, Rev. 2, "Generic Aging Lessons Learned (GALL) Report," dated December 2010, and LR-ISG-2012-02, "Aging Management of Internal Surfaces, Fire Water Systems, Atmospheric Storage Tanks, and Corrosion Under Insulation," dated November 2013.

3. Regulatory Audit Scope

The scope of this audit is to examine Entergy's RAI response, associated materials, and supporting documentation for the SWI and FWS AMPs. Audit team members will focus on reviewing the documents and requested information listed in the Audit Needs section of this plan and discussing the information with Entergy's subject matter experts.

4. Information and Other Material Necessary for the Regulatory Audit

As described in the Audit Needs List.

5. Team Assignments

Area of Review	Assigned Auditor
Project Manager	Michael Wentzel

Area of Review	Assigned Auditor
Technical Reviewer	James Gavula
Technical Reviewer	William Holston
Technical Reviewer	Brian Allik

6. Logistics

The audit will be conducted on location at the IP2 and IP3 site from February 23 to February 25, 2016. Entrance and exit briefings will be held at the beginning and end of the audit, respectively.

7. Special Requests

The NRC staff request a suitable facility for the audit team to caucus during the audit. In addition, the NRC staff request Entergy have one or more break-out rooms available for meetings between staff and Entergy personnel.

8. Deliverables

The NRC staff will issue an audit report to Entergy, which normally occurs within 90 days from the end of the audit.

9. References

- a. Periodic Summary Report of NRC Regulatory Commitment Changes at Indian Point 1 and 2, Letter NL-01-088, dated July 3, 2001.
- b. Reply to Request for Additional Information Regarding License Renewal Application – Operating Experience, Letter NL-08-091, dated June 5, 2008.
- c. NUREG 1930, “Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3, dated November 2009.
- d. Reply to Request for Additional Information Regarding the License Renewal Application, Indian Point Nuclear Generating Unit Nos. 2 & 3, Letter NL-14-147, dated December 16, 2014.
- e. Reply to Request for Additional Information Regarding the License Renewal Application, Indian Point Nuclear Generating Unit Nos. 2 & 3, Letter NL-15-092, dated August 18, 2015.

**Service Water Integrity and Fire Water System
Aging Management Programs
Audit Needs List
DATE**

1. Documents or Information for Review:
 - a. Plant-specific leak-related operating experience for the FWS and city water system (CWS), and all associated corrective action entries for the past 10 years. This should include all leaks with the exception of packing leaks.
 - b. Inspection reports for the 14 non-destructive evaluation (NDE) inspections for FWS (9 IP1 and 5 IP2).
 - c. T_{min} computations and stress reports to determine longitudinal pipe stress in the vicinity of the 14 NDE inspections.
 - d. Copy of preventive maintenance for charcoal replacement and sampling for the IP2, IP3, and Technical Support Center (TSC) charcoal filter units subject to aging management review for which aging effects are managed by the Fire Water Systems Program, as described in LRA B.1.14.
 - e. Drawings of charcoal filter units in relation to location of deluge piping.
 - f. Drawings showing the number and location of all wet pipe sprinkler systems subject to aging management review for which aging effects are managed by the Fire Water Systems Program, as described in LRA B.1.14.
 - g. Procedures used for implementation of the Service Water Integrity Program, as described in LRA B.1.34.
 - h. For the leaks discussed in response to RAI 3.0.3-4, request 4b (NL-15-092):
 - i. Provide associated corrective action documents for all service water system leaks within the past 10 years. In addition to these documents, also include a summary of all corrective action documents associated with the service water system within the past 10 years.
 - ii. Distinguish between those leaks associated with internal lining/coating issues (i.e., gaps in concrete lining, or failed coating) and those leaks not associated with internal coating issues.
 - iii. For any of the in-service inspection (ISI) Class 3 leaks where American Society of Mechanical Engineers (ASME) Code Case 513-3 was used, provide the locations of the augmented sample(s) examined and the engineering evaluations that identified these locations as being the most susceptible.
2. Interview and Discussion Meeting:
 - a. Discuss the adequacy of the number of inspections conducted to date to manage loss of material due to recurring internal corrosion in the fire water and city water systems. It is not clear to the staff that sufficient inspections have been conducted to justify a one-time based exclusion of future inspections (i.e., 9 inspections at Unit 1, 5 at Unit 2, none at Unit 3).
 - b. Discuss: 1) the effect of leakage on nearby safety-related components; 2) acceptance criteria in relation to the pressure boundary function and structural integrity (attached) function of the piping; 3) the lack of specificity related to extent of condition

inspections that would occur if opportunistic inspections or leakage events reveal wall loss sufficient to cause leakage, loss of pressure boundary function; or loss of structural integrity (attached) function; and 4) based on the probable lack of volumetric wall thickness data from original construction, specifically how inspection results were projected to 60 years.

- c. Describe the configuration of the water distribution piping inside each of the charcoal filter units subject to aging management review for which aging effects are managed by the Fire Water Systems Program, as described in LRA B.1.14. For example, is the water distributed by nozzles, or flow holes? Is the piping above or within the charcoal beds? Will the piping be inspected during charcoal replacement or sampling? What is the periodicity of replacement and sampling? Reference enhancements appearing in Attachment 2, page 10 of 13 of letter NL-15-092.
- d. Describe the periodicity and method for deluge valve testing for all charcoal filter beds subject to aging management review for which aging effects are managed by the Fire Water Systems Program, as described in LRA B.1.14. Exception No. 3, Attachment 2, page 57 of 66 of letter NL-14-147 states that, “[t]he deluge valve for the IP2 primary auxiliary building exhaust, containment building purge exhaust and containment building pressure relief charcoal units are tested each refueling outage, which is every two years.”
- e. Describe the number of wet pipe sprinkler systems in each building that are subject to aging management review for which aging effects are managed by the Fire Water Systems Program, as described in LRA B.1.14. In addition, provide the basis for inspecting one-third of the systems, as described in response to RAI 3.0.3-11 (NL-15-092) instead of one-half as cited by NFPA 25, ‘Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems,’ Section 14.2.
- f. Reconcile the response to RAI 3.0.3-4, request 4b (NL-15-092), which reported three ISI Class 3 leaks identified in 2013, with the statement in Licensee Event Report (LER) 247/2013-004 that eight pin hole leaks were discovered during an engineering walkdown of the service water system where “seven leaks were on socket welds and one was on an elbow with all located in the ASME Section XI Code boundary.”
- g. In context of the following statement (NL-01-088, Attachment 1), provide details relating to the radiographic inspections of the service water piping welds that are performed as part of the Generic Letter (GL) 89-13 program:

The exam is also more sophisticated than a random 10% of welds. For example, the exam for 10 inch piping inside containment is as follows:
20% of welds that have shown moderate scalloping, 5% of the welds that have shown scalloping, 1% of welds that have minor scalloping and 1% of previously accepted or repaired welds.
- h. Provide details relating to the internal visual inspections performed by the Service Water Integrity program, as described in LRA B.1.34 (i.e., how much piping is inspected and frequency of inspections). Describe the process for using the results from the visual inspections to directing volumetric inspections.
- i. Identify the approximate number of safety-related weld locations and nonsafety-related weld locations that are subject to aging management review for which aging effects are managed by the Service Water Integrity Program, as described in LRA B.1.34. Response 4c to RAI 3.0.3-4 (NL-15-092) states that 20 to 30 weld locations

are inspected each outage; what percentage of the total locations does this number represent?

- j. The response to RAI AUX-2 (NL-08-091, Attachment I) states that “the Service Water Integrity Program is credited for managing the effects of aging on components as listed in LRA Section 3 Tables regardless of safety classification.” LER 286/2011-003 states that the GL 89-13 program will be revised to include nonsafety-related service water lines 1221 and 1222. Provide discussion relating to how these piping segments will be treated differently in the GL 89-13 program as compared to how they were treated in the Service Water Integrity Program. Are these now the only nonsafety-related piping segments included in the GL 89-13 program?
- k. LER 286/2014-002 states that procedure 3-PT-185B was specifically developed to address problems with leaks developing in stagnant vent and drain connection piping and it is the main line of defense for preventing future leaks. The response to RAI 3.0.3-4 (NL-15-092) states that the flushing and inspections performed under 3-PT-185B have been effective at managing the effects of aging; however, leaks continue to occur in the associated piping. Of the leaks that occurred in the past 10 years, provide information about the leaks that occurred in the piping segments where 3-PT-185B was or should have been used.
- l. Inspections of the service water intake structure are included as part of GL 89-13. If these inspections are not part of the Service Water Integrity Program, as described in LRA B.1.34, which aging management program do these inspections fall under? Discuss the differences/similarities between the silting issue that is documented in LER 247/2011-003 and the silting levels seen in 2007. Discuss corrective actions from 2007, and whether these should have prevented the 2011 event.