



Indian Point Energy Center
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February 13, 2006

Re: Indian Point Unit No. 2
Docket No. 50-247
NL-06-008

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station O-P1-17
Washington, DC 20555-0001

Subject: Proposed Steam Generator Examination Program – 2006 Refueling Outage
(2R17)

Pursuant to the requirements of Indian Point Unit 2 Technical Specification 5.5.7.f.1, Entergy Nuclear Operations, Inc. (ENO) hereby submits its proposed steam generator examination program (Attachment 1) to be conducted during the 2006 refueling outage (2R17). This examination program was developed in accordance with industry guidelines defined in Nuclear Energy Institute (NEI) 97-06: "Steam Generator Program Guidelines," Rev. 2, and Electric Power Research Institute (EPRI) Report TR-1003138: "PWR Steam Generator Examination Guidelines," Rev. 6.

No new regulatory commitments are being made by ENO in this correspondence.

Should you or your staff have any questions regarding this matter, please contact Mr. Patric W. Conroy, Licensing Manager at 914-734-6668.

Very truly yours,

A handwritten signature in cursive script that reads "Patric W. Conroy".
Patric W. Conroy
Licensing Manager
Indian Point Energy Center

cc: next page

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Attachment:

1. Proposed Steam Generator Examination Program 2006 Refueling Outage

cc:

Mr. John P. Boska, Senior Project Manager
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U.S. Nuclear Regulatory Commission

Mr. Samuel J. Collins, Regional Administrator
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Mr. Peter R. Smith
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Mr. Paul Eddy
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ATTACHMENT 1 TO NL-06-008

Proposed Steam Generator
Examination Program
2006 Refueling Outage

Entergy Nuclear Operations, Inc.
Indian Point Unit No. 2
Docket No. 50-247

Indian Point 2
Proposed Steam Generator Examination Program
2006 Refueling Outage

A comprehensive steam generator (SG) examination program has been developed for implementation at Indian Point 2 (IP-2) for the second inservice inspection of the replacement steam generators during the Spring 2006 refueling outage (2R17). The examination program and methods comply with the IP-2 Technical Specifications and Entergy procedure EN-DC-317 "Entergy Steam Generator Administrative Procedure." The steam generator examination program was developed in accordance with industry guidelines defined by the Nuclear Energy Institute (NEI) 97-06: "Steam Generator Program Guidelines," Rev. 2, and Electric Power Research Institute (EPRI) Report TR-1003138: "PWR Steam Generator Examination Guidelines," Rev. 6.

The steam generator examination program incorporates both primary and secondary-side inspections. The scope of the inspections to be performed and the methods employed are detailed in Entergy Engineering Report No. IP-RPT-05-00408: "Steam Generator Pre-Outage Degradation Assessment and Repair Criteria for 2R17, ER-IP2-05-20801," Rev. 0 (Reference 1). The degradation assessment defines an integrated plan for the detection, quantification and assessment of degradation of both primary and secondary side steam generator components that could affect structural integrity, pressure boundary leak tightness, and operating reliability.

The primary-side examination plan utilizes eddy current test (ECT) methods to detect and assess potential steam generator tube degradation, and visual inspection to assess the condition of the primary channel head, cladding, and steam generator tube plugs. The secondary-side examination plan utilizes visual inspection to assess steam generator internals, both in bundle and top of tubesheet regions. Visual examination is also utilized to detect loose parts and to assess other secondary-side component conditions that could affect the structural integrity and leak tightness of pressure boundaries.

Elements of the primary and secondary-side inspections described herein address compliance with Technical Specifications, NEI 97-06, and industry guidelines. ENO's compliance with NEI 97-06 is mandated by EN-DC-317 "Entergy Steam Generator Administrative Procedure", which provides for management discretion to define the scope and frequency of certain steam generator examinations that go beyond the requirements of the Technical Specifications. To the extent that the steam generator examination plan for the Spring 2006 exceeds existing Technical Specification requirements, no new licensing commitments are intended or implied in this plan. Specific details of the 2006 refueling outage steam generator examination program are summarized below.

Steam Generator Primary-Side Inspection

Primary-side steam generator examinations are summarized in Table 1. Fifty percent (50%) of active steam generator tubes will be examined from tube end to tube end utilizing eddy current test (ECT) methods as specified in Table 1. A full length bobbin probe inspection will be performed of the tubes in Rows 3 and higher. In Rows 1 and 2, a bobbin probe inspection will be performed of the hot and cold straight leg sections inclusive of the upper support plate, while U-bends in these two rows will be inspected by rotating Plus Point probe. In addition 20% of hot leg tubes in four steam generators will be inspected at the top of the tubesheet +/- 3 inches by rotating Plus Point probe.

Potential and actual indications of degradation by the bobbin probe will be further characterized and confirmed by rotating Plus Point probe. The basis used to determine the scope of any selected inspection sample or need to perform an expansion of the inspection scope shall comply with the requirements of the Technical Specification 5.5.7 and the EPRI PWR Steam Generator Examination Guidelines Rev. 6.

Other inspection probes and methods may be used at the discretion of ENO. Supplementing steam generator tube ECT inspections, visual inspection will be performed of the primary channel heads and tubesheet, including previously plugged tubes (sixteen tubes were plugged in various steam generators during 2R15 and two tubes in SG24 were plugged at the factory during manufacturing), in accordance with the requirements of the Westinghouse SG Technical Manual and site procedures.

The ECT methods employed to inspect steam generator tubes meet the requirements of the EPRI PWR Steam Generator Examination Guidelines, Rev. 6, and are qualified in accordance with Appendix H of those guidelines. ECT data analysts will be qualified using a site specific training program in accordance with Appendix G of the same EPRI guideline document. Bobbin probe inspection will be performed of all straight leg tube sections and U-bends in Rows 3 and higher with the maximum diameter probe feasible, which is typically a 720 mil diameter probe.

The results of ECT shall be reviewed, and degraded and defective steam generator tubes shall be identified. The cause of degradation and degradation measurement parameters in degraded steam generator tubes shall be assessed against established structural limits (Reference 2) and Technical Specification criteria, and the result shall be incorporated in the Operational Assessment. If any defective tubes are detected, a bounding selection of defective tubes shall be pressure tested and the results shall be compared against performance criteria for structural integrity and accident leakage and incorporated into the Condition Monitoring Assessment. For tubes with existing degradation, the Operational Assessment shall suitably account for uncertainties in eddy current measurements and continued tube wall degradation between consecutive inspection periods.

Degraded tubes, as defined by TS 5.5.7.a.4, shall be considered acceptable for continued service only if the degradation meets the more restrictive of the requirements of TS 5.5.7.e.1 or the required industry standard (NEI 97-06) operational assessment for the next period that conservatively demonstrates continued structural integrity including consideration of ECT error and degradation growth. Tubes that contain degradation that exceeds the more limiting requirement shall be removed from service by plugging. ENO may administratively plug tubes for other reasons. Prior to leaving a degraded tube in service, Entergy will submit to the NRC the bases of such decision including the method of inspection, the plugging criterion used, and a description of the methodology used to develop this criterion.

Any decision to leave degraded tubes in service at Indian Point 2 will be documented in the Condition Monitoring and Operational Assessment (CMOA) Report and justified in accordance with the requirements of the Steam Generator Program Plan, NEI 97-06 and EPRI Steam Generator Examination Guidelines Rev. 6. The basis to leave degraded tubes in service will duly consider ECT inaccuracy and projected degradation growth rate over the next operating cycle.

Steam Generator Secondary-Side Inspection

Visual inspection is utilized to assess the presence of loose parts or other steam generator secondary-side component conditions that could affect the structural integrity of the primary boundary and leak tightness.

The secondary-side inspection will incorporate sludge lancing and foreign object search and retrieval (FOSAR). In-bundle inspection will be performed in approximately every fifth column.

A top support plate inspection will be performed on one steam generator. Depending on the results found in the first steam generator the top support plate inspection may be expanded to the other steam generators.

References:

1. Engineering Report IP-RPT-05-00408, "Steam Generator Pre-Outage Degradation Assessment and Repair Criteria for 2R17, ER-IP2-05-20801"
2. Westinghouse Electric Company CN-SGDA-02-128 Rev. 2 "Regulatory Guide 1.121 Analysis for the Indian Point Unit 2 Model 44F Replacement Steam Generators"

Table 1: Steam Generator Primary-Side Inspection Plan for 2R17

Inspection	Inspection Scope	Number of Steam Generators
ECT Bobbin Coil	50% of tubes – end to end ¹	Four steam generators
ECT Bobbin Coil	50% of Row 1 and Row 2 straight lengths hot and cold legs	Four steam generators
ECT Rotating Probe (Plus Point)	50% of Row 1 and Row 2 U-bends	Four steam generators
ECT Rotating Probe (Plus Point)	20% of hot leg tubes at the top of tubesheet +/- 3 inches	Four steam generators
ECT Rotating Probe (Plus Point)	Indications of degradation by Bobbin probe	To be Determined
Visual	Channel head, cladding, plugs	Four Steam Generators

Notes:

- 1) Bobbin coil is not qualified for Row 1 and Row 2 U-bends.

Table 2: Steam Generator Secondary-Side Inspection Plan for 2R17

Task and Inspection Method	Inspection Scope	Number of Steam Generators
Sludge Lancing	Top of tubesheet	Four steam generators
In-bundle FOSAR - Visual	Top of Tubesheet and tube bundle	Four steam generators
Outer Annulus Visual	Region between wrapper and outer shell	Four Steam Generators
Flow Distribution Baffle Visual	Top of plate the full length of tube lane	Four Steam Generators
Support Plates Visual	Top Support Plate	One Steam Generator. Depending on results of first steam generator inspection may be expanded to the other steam generators.