

MEMORANDUM TO: John F. Rogge, Chief
Project Branch 2
Division of Reactor Projects

THRU: William J. Lazarus, Chief
Civil, Mechanical, and
Materials Engineering Branch
Division of Reactor Safety

FROM: Joseph E. Carrasco, Engineering Inspector
Civil, Mechanical, and
Materials Engineering Branch
Division of Reactor Safety

SUBJECT: INPUT FOR INDIAN POINT 2 INSPECTION REPORT NO 97-07

The suggested wording to be used for the cover letter is indicated below, and attached is the feeder for the Indian Point 2 Inspection Report No. 50-247/97-07.

Cover Letter Input

The purpose of this inspection was to assess the IP2 Steam Generators as a part of "Inservice Inspection." We focused our attention on the effectiveness of your programs in detecting and analyzing degraded tubing, repair of defects, and correcting conditions contributing to tube degradation.

We concluded that your staff has an effective and efficient means to monitor and control the Nondestructive Examination (NDE) activities of the present outage and the Eddy Current activities of the steam generators.

Executive Summary Input

An inspection was performed on May 27-30, 1997 to determine whether the licensee has an adequate control over nondestructive examination (NDE) and the Eddy Current activities performed on the Steam Generators by contractor(s).

We assessed the effectiveness of the licensee's controls over the NDE activities implemented by contractors during this outage, and we concluded that the licensee

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have an effective means of controlling the NDE activities by determining the scope and by reviewing and approving NDE procedures submitted by your contractor(s). Based on a review of licensee's specification, qualification and certification records of eddy current personnel (ET), interviews with ET personnel and direct observation of the ET activities, we concluded that the licensee is maintaining a good system of controls to ensure the contractor qualification and certification of ET personnel.

The licensee is in control over the Steam Generators eddy current testing in progress at IP2. The licensee is cognizant of the eddy current techniques, and the stipulations of Technical Specifications on SGs. Westinghouse appeared to be conducting the Eddy Current activities with the latest available eddy current techniques and with state-of-the-art equipment. However, further discussion on the uses of Cecco-5 versus Plus Point probes as a primary detecting probe is in progress between the licensee and NRR.

Attachment: Feeder for Indian Point 2 Inspection Report No. 50-247/97-07.

cc w/Attchmt:

J. Wiggins, DRS

R. Temps, SRI, IP2

DRS File

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Report Details

III. Engineering

E1 Indian Point 2 Inservice Inspection (ISI) 1997 Refueling Outage (RFO)

a. Inspection Scope (73753 & 50002)

The purpose of this inspection was to assess the IP2 Steam Generators as a part of "Inservice Inspection." We focused our attention on the effectiveness of your programs in detecting and analyzing degraded tubing, repair of defects, and correcting conditions contributing to tube degradation.

b. Observations and Findings

Assessment of ISI Activities

The Indian Point 2 (IP2) Inservice Inspection (ISI) for this Refueling Outage (RFO) represents the second outage of the third ISI interval. Since the licensee is on a 24 month cycle, they have five scheduled outages per ten year interval, as opposed to the more common six outages. Therefore, two separate ISI plans are being performed during the 1997 RFO. The licensee took credit for completed examinations as required by the American Society of Mechanical Engineers (ASME) Code Section XI, IWB-2412 and IWC-2412. The inspector verified the ISI program scoping the ASME Section XI components by groups. The licensee explained that the grouping areas approach allows them to be more efficient in the uses of scaffolding and manpower allocation. In addition, the grouping areas approach is also effective in maintaining the radiation exposure as low as reasonable achievable (ALARA).

The present licensee's ISI outage plan includes welding inspections on the following components: the reactor head, steam generator 21 circumferential welds and secondary side nozzle welds, pressurizer and pressurizer relief nozzles, Residual Heat Removal (RHR) and regenerative heat exchanger, and various Class 1 and 2 piping welds and pipe supports.

Effectiveness of Licensee Controls over Inservice Inspection (Nondestructive Examination) Activities

The inspector verified that the licensee has adequate controls over the Inservice Inspection nondestructive examination (NDE) activities of the

present outage, because the licensee determines the scope of work that will be required to be performed during this outage by the contractor(s). This scoping is based on the licensee's ISI program.

Another means of effective licensee's control of the NDE activities is through detailed review and approval of NED procedures prepared by the contractor(s). The contractor submits the NDE procedures to the licensee for review and comment. The inspector noted that the licensee reviewed these procedures against check lists developed from the ASME Code in effect for the current inspection interval. Procedures that are found not to be satisfactory have comments noted, and a letter is then sent to the contractor requesting that the comments be addressed. The revised procedures are then returned and reviewed. Either an additional comment letter is sent, or the procedure is logged as being approved. Once the procedures are approved, the licensee prepares an acceptance letter documenting that acceptance.

Conclusion

The licensee appears to have an effective means to control the NDE activities by determining the scope and by reviewing and approving NDE procedures submitted by the contractor. The licensee NDE Level III was found knowledgeable and in control of the procedures used by the contractor for the implementation of this NDE outage activity.

Assessment of the ISI of the Steam Generators

The focus of this inspection was to assess the adequacy of the licensee controls over the eddy current activities for the steam generators.

IP2 has four Westinghouse Model 44 steam generators. High temperature mill annealed Alloy 600 tubing, manufactured by Huntington Alloys is used. 5.8% of the 13040 tubes have been plugged during the 23 years of service. An additional 2.9% have been plugged prior to service. Current analysis permits plugging 25% of the tubes. The unit has had four forced outages caused by tube leaks. The last inservice event occurred in 1988 as a result of a leaking plug.

Tube Examination Program Implementation

The tube examination program was prepared in accordance with the EPRI steam generator tube inspection guidelines. As a result of early eddy current inspection findings an expansion was made to inspect all support plate

intersections with the Cecco-5 probe and all full lengths with the bobbin coil probe.

To assess the steam generators tube examination program, the inspector walked through the data acquisition trailer, interviewed the Westinghouse Supervisor, and observed eddy current activities in progress concluding that Westinghouse appeared to be using the latest available state-of-the-art robotics used to conduct the eddy current of the SG's tubes.

In terms of the probes being used in this eddy current examination, the inspector noted that the Cecco-5 transmit-receive eddy current probe is being used as the primary inspection probe. Rotating coil probes, primarily Plus Point probes, are being used to characterize the indications identified by the Cecco-5 probe. The bobbin coil portion of the Cecco-5 probe is being used to examine the straight portions of the tube at elevations higher than 20 inches above the tube sheet. The tube sheet area and the lower 20 inches are being examined with the Cecco probe.

Alloy 600 tube explosive plugs were replaced in all hot legs and the cold leg of SG 24. Cold leg A600 Westinghouse mechanical plugs will be replaced in 2 SGs. The remaining plugs will be replaced during the next two upcoming outages.

Present Status of the Eddy Current Activities

The inspector participated in a conference call between NRR and the licensee to discuss the SGs eddy current activities at IP2. The inspector captured the following highlights: the eddy current testing has identified a new degradation mechanism operational in the steam generator tubes outside diameter stress corrosion cracking. Using Cecco-5 eddy current probes, indications were seen in the support plate crevices, in the sludge pile area above the tube sheet, and the crevice between the tube sheet and the tubes. At least one indication in each of these areas has been characterized by the rotating Plus Point probe. A ten inch long axial indication within the tube sheet crevice is a prime candidate for in-situ pressure testing of the tube.

In the primary side of the SGs to date (June 27 '97) 98 defective tubes have been identified for plugging. Steam Generator will have more than 1% of the inspected tubes plugged. 308 new distorted roll indications (DRIs) have been noted. These indications will be characterized and rerolled. Seven steam generator plugs plug-in-plug (PIPs) and plug-at-plug (PAPs) were surrounded by boron rings. These plugs will be drilled out and replaced with Westinghouse Alloy 690 mechanical plugs. The end of one Westinghouse

explosive appears to have broken off. This is a portion that extended past the tube end and is not in the seal area. No boron crystals were present around this plug.

In the secondary side flow slot examination of Steam Generator 22 and 23 showed closure of one flow slot in Steam Generator 23. The flow slots of the other two steam generators will be examined. The Hillside port examined in Steam Generators 22 and 23-flow holes were open, and a small amount of corrosion deposit surrounded about a 1/2 inch of the tube above the support plate.

The licensee has performed a comparison of probes Cecco-5 to Plus Point by examining 124 intersections. Cecco reported 1 tube support plate indication and 5 sludge pile indications Plus Point did not report any indications.

Conclusion

The licensee is in control of the Steam Generators eddy current testing in progress at IP2. The licensee is cognizant of the Technical Specifications, specifically, for the results in SG21 and SG22, the licensee may be required to declare the steam generators in a C-3 category in accordance with the Technical Specifications 4.13.

Qualifications of Eddy Current Examination Personnel

The inspector reviewed records of the qualifications and certifications of the Westinghouse personnel involved in the performance of the steam generator tubing eddy current data acquisition and analysis activities. Based on this review, and interviews with eddy current (ET) personnel, the inspector determined that these individuals met the qualification and certification requirements stated in the pertinent supplement of SNT-TC-1A and ASME Code Section XI.

The inspector verified that the licensee has a written specification (T&P94-01, Revision 0) outlining the acceptance criteria for ensuring that the Westinghouse personnel involved in the performance of the steam generator tubing ET data acquisition and analysis activities meet the requirements of ANST "Recommended Practice" No. SNT-TC-1A-1984. The inspector verified that the licensee has computerized records to control of the latest qualifications and certifications of eddy current levels II and III Westinghouse and its subcontractors personnel engaged in data acquisition and analysis activities. The inspector interviewed the supervisor of the Westinghouse data acquisition group and observed the ET operation in progress and noted

that the supervisor and his staff were knowledgeable and experienced in the remote control manipulation of the different probes used in this ET operation.

Conclusion

Based on the review of the licensee's specification, qualification and certification records, interviews with ET personnel and direct observation of the ET activities in progress, the inspector concluded that the licensee maintains a good system of controls on the contractor qualification and certification of ET personnel.

c. Conclusion

We concluded that your staff has an effective and efficient means to monitor and control the Nondestructive Examination (NDE) activities of the present outage and the Eddy Current activities of the steam generators.

PARTIAL LIST OF PERSONS CONTACTED

Steve Quinn	ConEdison VP
Peter Szabados	Chief Engineer
John Schwartz	QA Examiner
Peteris Skulte	Principal Engineer
Paul Deeds	Senior Engineer
Charles Jackson	ConEdison Manager Licensing