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VISSING,G.

SUBJECT: Submits response to GL 97-05,dtd 971217 re SG tube insp techniques.

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ROBERT C. MECREDY
Vice President
Nuclear Operations

March 23, 1998

U.S. Nuclear Regulatory Commission
Document Control desk
Attn: Guy Vissing
Project Directorate I-1
Washington, D.C. 20555

Subject: Response to NRC Generic Letter 97-05, dated December 17, 1997; SUBJECT: STEAM GENERATOR TUBE INSPECTION TECHNIQUES.
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Vissing:

Generic Letter 97-05 requested from licensees of pressurized-water reactors (PWRs) to provide a response within 90 days to the information requested in the generic letter. The information requested in GL 97-05 is as follows:

Requested Information

(1) whether it is their practice to leave steam generator tubes with indications in service based on sizing,

(2) if the response to item (1) is affirmative, those licensees should submit a written report that includes, for each type of indication, a description of the associated nondestructive examination method being used and the technical basis for the acceptability of the technique used."

Background

Ginna Station completed a Steam Generator Replacement Project in 1996 and has one refueling outage since that time. The replacement steam generators were manufactured by Babcock and Wilcox International (BWI) in Cambridge, Ontario Canada. A 100% bobbin coil tube end to tube end baseline eddy current examination was performed at the tubing manufacturer's site prior to shipment to BWI. A 100% bobbin coil tube end to tube end ASME Section XI baseline examination was performed at BWI prior to shipment to the Ginna Site. In addition, a post installation preservice peripheral examination was then performed on site at Ginna. The first refueling inspection was performed during the October 1997 outage and included a 100% bobbin coil tube end to tube end examination.

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During these inspections, MRPC examinations were also performed on bobbin coil signals, manufacturing anomalies, expansion transitions and tight radius U-Bends. Based on these examinations, a knowledge base has been established for subsequent examinations.

The requirements for steam generator tube inspections are included in the Ginna Inservice Inspection Program. The program includes the requirements of the ASME Section XI Code, under category B-Q, item number B16.20. The tube inspection program also incorporates the requirements of the USNRC Regulatory Guide 1.83, Revision 1, dated July, 1975, "Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes".

Reply to Question 1:

Ginna has not detected any degradation in the BWI replacement steam generators. Presently, Ginna does not leave any indications inservice based on eddy current sizing techniques.

Reply to Question 2:

Preamble

The nuclear power industry recently voted to adopt an initiative requiring each utility to meet the intent of the guidance provided in Nuclear Energy Institute (NEI) 97-06, Steam Generator Program Guidelines, no later than the first refueling outage starting after January 1, 1999. As required by NEI 97-06, each utility is required to follow the inspection guidelines contained in the latest revision of the EPRI PWR Steam Generator Examination Guidelines. The industry recommended implementation of Revision 5 of the Guidelines by April 1, 1998.

Appendix H, Performance Demonstration for Eddy Current Examination, of the PWR Steam Generator Examination Guidelines, Revisions 3 through 5, provide guidance on the qualification of steam generator tubing examination techniques and equipment used to detect and size flaws. Damage mechanisms are divided into the following categories: thinning, pitting, wear, outside diameter IGA/SCC, primary side SCC, and impingement damage.

For qualification purposes, test samples are used to evaluate detection and sizing capabilities. While pulled tube samples are preferred, fabricated samples may be used. If fabricated test samples are used, the samples are verified to produce signals similar to those being observed in the field in terms of signal characteristics, signal amplitude, and signal-to-noise ratio. Samples are examined to determine the actual through wall defect measurements as part of the Appendix H qualification.

The procedures developed in accordance with Appendix H specify the essential variables for each procedure. These essential variables are associated with an individual instrument, probe, cable, or particular on-site equipment configurations. Additionally, certain techniques have undergone testing and review to quantify sizing performance. The sizing data set includes the detection data set for the technique with additional requirements for number and composition of the grading units.

Sizing Techniques

Even though Ginna Station has new steam generators which do not have indications of inservice degradation, the following techniques would be used for sizing if degradation were detected at some future inspection.

Wear

For wear at lattice grid supports, or fan bars (U-Bend Supports), sizing would be accomplished using either prime frequency/quarter prime frequency differential mix, prime frequency/quarter prime frequency absolute mix or the half prime frequency/quarter prime frequency absolute mix of the bobbin probe. A calibration curve for the maximum vertical amplitude would be determined based on the applicable standards replicating the damage mechanism type and quantity. The calibration curve would represent the full range of expected depths.

This sizing qualification is based on 64 sample data points. The samples ranged in depth from 4% to 78% through wall depth. This database would be reviewed to ensure that application of the sizing procedure is consistent with steam generator conditions at Ginna. Therefore, the sizing procedure for wear would be qualified for Ginna in accordance with paragraph 6.2.4 of the PWR Steam Generator Examination Guidelines, Revision 5.

Manufacturing Burnish Marks

The Appendix H qualification of this technique was sponsored by Ginna Station for small volume manufacturing burnish marks. This technique uses the 140KHZ absolute signal off the bobbin probe to size the burnish mark. A calibration curve is established using a manufacturing burnish mark calibration standard with nominal 5% and 10% burnish marks. The depth size is achieved by the maximum amplitude response from the 140KHZ absolute response.

The sizing procedure is based on the analysis of 33 sample data points. The samples ranged in depth from 1% to 10%. The database has been reviewed to ensure that application of the sizing procedure is consistent with the steam generator conditions at Ginna. Therefore, the sizing procedure for manufacturing burnish marks is site qualified for Ginna in accordance with paragraph 6.2.4 of the PWR Steam Generator Examination Guidelines, Revision 5.

Tube Proximity

Just prior to the first Steam Generator Inservice Inspection in 10/97, Ginna Station became aware of the possibility of an out of design tolerance through Babcock and Wilcox International. This tolerance relates to the tube to tube proximity within the u-bend in the outermost radius tubes. Baseline eddy current data was reviewed, along with data from a tube to tube mockup. Bobbin coil and MRPC plus point/pancake coils were used during this first inservice inspection to obtain data in the area of interest. Indications of tube to tube proximity were detected with the bobbin coil and pancake coil. The plus point coil detected no degradation. All tubes with confirming proximity indications were bounded by one tube. These proximity indications were confirmed with a comprehensive secondary side visual inspection, including mechanical measurements where possible. A small number of outer periphery tubes were confirmed to be out of design tolerance but there was no indication of contact, thus no wear and no sizing.

Ginna will be taking a proactive approach in achieving qualified techniques that may be relevant for tube to tube proximity. Appropriate information will be gathered in the identified tubes during subsequent outages.

Very truly yours,

Robert C. Mecredy

Subscribed and sworn to before me
on this 23rd day of March, 1998

Deborah A. Piperni

DEBORAH A.PIPERNI
Notary Public in the State of New York
ONTARIO COUNTY
Commission Expires Nov. 23, 19 99

xc: Mr. Guy S. Vissing (Mail Stop 14B2)
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