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SUBJECT: Forwards initial insp scope,basis for initial scope & criteria for expansion for steam generator tube insp plan, per 930819 ltr.

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JAMES M. LEVINE
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102-02751-JML/BAG/JRP
December 6, 1993

U. S. Nuclear Regulatory Commission
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Washington, D.C. 20555

Reference: Letter dated August 19, 1993, from T.E. Murley, Director, Office of Nuclear Reactor Regulation, USNRC, to W.F. Conway, Executive Vice President, Nuclear, APS

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
Steam Generator Tube Inspection Plan
File: 93-056-026

By the referenced letter dated August 19, 1993, the NRC required that Arizona Public Service Company (APS) provide the scope of the Unit 2 Eddy Current Testing (ECT) inspection at least six weeks prior to the scheduled start of the inspection. The enclosure to this letter contains the initial inspection scope, the basis for the initial scope and the criteria for expansion.

Should you have any questions, please contact Richard A. Bernier at (602) 393-5882.

Sincerely,

James M. Levine

JML/BAG/JRP/rv

Enclosure

cc: W. F. Conway
B. H. Faulkenberry
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ENCLOSURE

UNIT 2 STEAM GENERATOR TUBE INSPECTION PLAN

UNIT 2 STEAM GENERATOR TUBE INSPECTION PLAN

The Unit 2 steam generators will be inspected for tube defects using eddy current testing (ECT) technology as opposed to ultrasonic or other non-destructive examination methods. The initial inspection scope, the basis for the initial scope and the criteria for expansion, are described below:

Initial Scope

- Approximately 3800 tubes in the analytical arc, as defined by the Unit 2 Steam Generator Tube Rupture Analysis Report, dated July 18, 1993, will be inspected full length with bobbin coil.

- 08H to the first vertical support will be inspected with MRPC (approximately 1800 tubes in the area for highest interest).

- Approximately 20% at the top of the Tubesheet (hotleg) will be inspected with Motorized Rotating Pancake Coil (MRPC), concentrating in the sludge pile.

- Approximately 400 tubes in a checkerboard pattern outside of the arc will be inspected full length with bobbin coil.

Basis for Initial Scope and Criteria for Expansion

The tube pull results from the (U2R4) inspection indicated that the bobbin coil probe is an effective method of scanning for critical axial indication of the type previously seen in Unit 2. The detectability studies conducted in Unit 2 indicate that the bobbin coil technique provides a detectability threshold of approximately 50% throughwall in straight runs of tubing. The 3800 tubes in the analytical arc that will be inspected full length with the bobbin coil will ensure that the arc is bounded.

The 1800 tubes in the area of highest interest (within the analytical arc), which were empirically determined during the U2R4 inspection, will be MRPC inspected from 08H to the first vertical support. This would help determine if cracks are developing due to the same phenomenon as seen in the previous inspection.

The MRPC of 20% at the top of the Tubesheet (hotleg), concentrating in the sludge pile, assures circumferential cracks are not forming or that indications previously noted are not progressing.

Full length bobbin coil testing of approximately 400 tubes in a checkerboard pattern outside of the arc provides defect information throughout the steam generator to ensure that the failure mechanism is bounded within the arc. When taken in conjunction with data below the 08H level from the sample of 3800, this provides approximately a forty percent sample size to identify defects not within the analytical arc.

The criteria for expansion must be adequate to ensure marginal tubes are identified. Therefore, the following expansion criteria are established:

- A buffer zone of five tubes (in all directions) without axial crack indications will be maintained from the edge of the analytical arc bobbin coil inspected area.
- MRPC will be conducted to resolve "I" code indications (NQI, DSI, DTI, and SVI).[1]
- Any circumferential crack at the Tubesheet (hotleg) triggers a 100% MRPC of the Tubesheet (hotleg) area in the affected steam generator.
- If any No Bobbin Indication (NBI) axial crack is detected in the arc of 1800 tubes, and which is predicted to exceed Regulatory Guide 1.121 limits, MRPC the remaining 2000 tubes in the analytical area from 08H to the first vertical support.
- A six percent bobbin coil expansion will be undertaken if a crack indication is found outside of the analytical arc.

Tubes will not be pulled from Unit 2 steam generators during U2M5 unless a new unexplained failure mechanism is identified by ECT inspection, or tube samples are necessary to show compliance with RG 1.121.

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1 NQI - Non Quantifiable Indication; DSI - Distorted Support Signal with Indication; DTI - Distorted Top of Tubesheet with Indication; SVI - Single Volumetric Indication

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, J. M. Levine, represent that I am Vice President Nuclear Production, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true and correct.

J. M. Levine

Sworn To Before Me This 6th Day Of December, 1993.

Notary Public

My Commission Expires:

OFFICIAL SEAL
RAMONA WRIGHT
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires Aug. 15, 1997