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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
Special Report

In accordance with Appendix A, Beaver Valley Power Station Technical Specification 4.4.5.5.a, "Steam Generators," the following Special Report is submitted. This information documents the number of tubes removed from service during the Unit 2, August 1998, steam generator eddy current examination. The final review and acceptance of the eddy current data was on September 2, 1998.

One hundred percent (100%) of the inservice tubes in Steam Generators 2RCS-SG21A, -SG21B and -SG21C were examined full length with bobbin coil probes. A 3-Coil Zetec Plus Point probe (consisting of the Plus Point, 0.115" and 0.080" coils) was used to examine 100% of the hot leg top-of-tubesheet region in each steam generator. A single coil Plus Point probe was used for low row U-bend examination. Tubes with crack-like indications identified in this area were removed from service. All circumferential indications were stabilized prior to removing the tube from service through plugging.

A Zetec 3-Coil Rotating Pancake Coil probe (consisting of a 0.115" diameter pancake coil, axial and circumferential detection coils) was used on indications that could not be resolved through standard bobbin coil testing. 100% of dents and free-span dings ≥ 2.00 volts, located between the top of the hot leg tubesheet and the third hot leg support plate, were examined with the 3 coil Plus Point probe. In addition, 100% of the dents ≥ 5.00 volts, located at tube support plate intersections, were also examined with the 3 coil Plus Point probe.

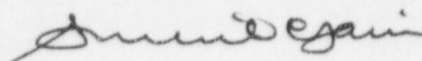
Examination of the steam generator preselected to meet the Technical Specification required sample, 2RCS-SG21C, resulted in a total of three (3) tubes being removed from service. Attachment 1 lists the tubes removed from service for each steam generator.

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During the August 1998 examination, it was discovered that several tubes in Generator 2RCS-SG21C were mis-encoded during the Unit 2 Sixth Refueling Outage (September 1996). Attachment 2 describes this discrepancy and the preventive measures which are currently in place and those which will be implemented to guard against further instances of mis-encoding the tubes.

Sincerely,



Sushil C. Jain

c: Mr. D. S. Brinkman, Sr. Project Manager
Mr. D. M. Kern, Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator

ATTACHMENT 1

	2RCS-SG21A	2RCS-SG21B	2RCS-SG21C
Tubes previously removed from service prior to August 1998	84	75	88
Number of tubes removed from service August 1998:			
Single Circumferential Indication @ Hot Leg Tubesheet	3	1	1
Single Axial Indication @ Hot Leg Tubesheet	-	1	-
PIT @ Hot Leg Tubesheet	1	-	-
Single Volumetric Indication @ Cold Leg Tubesheet		-	1
Single Volumetric Indication @ 8 th Hot Leg Support +11.32"	-	1	-
Free-span Pitting (Between 6 th & 7 th Hot Leg Support)	-	3	-
Single Volumetric Indication @ 2 nd Hot Leg Support	-	-	1
Number of tubes removed from service after August 1998	88	81	91

ATTACHMENT 2

Mis-encoded tubes During the Unit #2, September 1996 S/G Examination

During the 1998, Unit 2 steam generator eddy current examination, it was discovered that a total of twenty-six tubes were improperly encoded in steam generator 2RCS-SG21C during the previous outage (September 1996). This discrepancy resulted in a total of nine tubes not being examined with bobbin coil. The reports submitted to the NRC dated October 9, 1996, which document the results of the September 1996 examination, are in error. The reports state a 100% bobbin coil examination was performed in all steam generators when in fact only 99.7% of the inservice tubes in 2RCS-SG21C were examined.

There were two scenarios involving these discrepancies:

The first scenario involved twenty-five tubes being improperly encoded. This error occurred directly after a manipulator arm pivot move in which the manipulator must be relocated (tilted) away from the channelhead divider plate. This condition poses the greatest challenge for accurate re-positioning of the manipulator. It was during the re-calibration of the manipulator that an error occurred in locating the proper target tubes that are used for position verification (tubes used were one row off). Indications that were recorded in the mis-encoded tubes during the September 1996 examination, could not be verified in the 1998 examination. This led to an extensive search of all tubes affected by the error. One calibration group containing 25 tubes was identified. Each tube that was improperly encoded was "fingerprinted" to verify proper identification. The end result showed eight tubes not being examined with bobbin coil during the 1996 examination.

The second scenario involved the use of dual guide tubes and 1 tube being mis-encoded. Dual guide tubes consist of a "fixed" primary guide tube and a "moving" secondary guide tube. Earlier versions of the software (September 1996) used to control the guide tube movement allowed the recording of data prior to the secondary guide tube being "On Condition". "On Condition" is defined as the manipulator completing a desired movement, at which time the row and column values for a given tube location are passed from the fixture control software to the data acquisition software. In this case, data acquisition was started prior to the secondary guide tube being fully aligned with the center of the tube that was to be examined. Instead, the adjacent tube was inadvertently re-examined a second time. (The row and column number of the correct tube location was passed from the manipulator to the acquisition software as the manipulator completed its move). The end result was one (1) tube not examined with bobbin coil during the September examination.

The following are preventive measures that are currently in place to guard against instances of mis-encoding tubes:

- Data acquisition is required to provide a written message to each calibration group indicating each plug location observed during the examination. Data analysis verifies the message as being valid.
- The BVPS site analysis guidelines require a review of all previous history on indications. If an indication is not observed during the present outage, a detailed historical review is performed. In essence, this is a position verification for all tubes that have previous indications.

ATTACHMENT 2 (cont.)

- The use of independent databases to track new and previous indications.

The following additional measures will be implemented to guard against further instances of mis-encoding the tubes:

- The issue involved with the 25 mis-encoded tubes is directly tied to the specific manipulator used (Zetec SM-22). Operator training will be enhanced to provide additional information in the operation of this manipulator and increased awareness of the problems associated with manipulator relocation. (NOTE: This manipulator was not used during the August 1998 examination at Unit 2. In fact, the SM-22 has not been used at BVPS since the Unit 2 September 1996 outage.)
- The issue of acquiring data before the secondary guide tube has stopped has been addressed in later versions of the dual guide tube software.
- The BVPS site analysis guidelines currently require the manipulator operator to perform a position verification at the beginning and end of each calibration group. The location used for verification can be a tube, a plug or stay rod or any other location on the tubesheet. The next revision of the guidelines will require the location used to verify position to be a tube plug. Since tube plug locations are independently verified as part of the installation process, using known plug locations should provide added assurance the operator is using the proper location as a point of reference.