

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

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Washington, D. C. 20555

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Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
GENERIC LETTER 97-05 - STEAM GENERATOR TUBE INSPECTION TECHNIQUES
REQUEST FOR ADDITIONAL INFORMATION

During an August 28, 1998 telephone call between Mr. G. E. Edison of the NRC and Mr. G. D. Miller of Virginia Electric and Power Company (Virginia Power), the NRC requested additional information as a result of their review of Virginia Power's response to Generic Letter 97-05. The request was also provided by the NRC in written form via facsimile on the same date. Specifically, the NRC has requested clarification in order to assess the adequacy of steam generator tube inspection techniques employed at Surry Power Station. Virginia Power's response to the request for additional information is provided in the attachment.

If you have any further questions or require additional information, please contact us.

Very truly yours,



James P. O'Hanlon
Senior Vice President - Nuclear

Attachment

Commitments contained in this letter: None.

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cc: U.S. Nuclear Regulatory Commission
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Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

ATTACHMENT

SURRY POWER STATION UNITS 1 AND 2

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

NRC Comment:

During the review of Virginia Power's response to Generic Letter (GL) 97-05, "Steam Generator Tube Inspection Techniques," the staff noted one area that required additional clarification in order to assess the adequacy of inspection techniques employed at Surry Power Station. In this regard, provide the following information to the NRC:

The licensee reported in its response to GL 97-05 that at least one tube with a 24 percent throughwall pit-like indication is in service in the Surry Unit 2 steam generators. The staff notes that domestic industry experience to date has not confirmed pitting as a degradation mode for similar steam generator tubes. Please provide to the NRC the number of tubes currently in service with volumetric (i.e., pit-like) indications at each Surry unit that have been sized using eddy current methods and dispositioned relative to the steam generator tube repair limits in the technical specifications. In addition, please provide supporting information for concluding that the indications are, in fact, pits and can be sized using appropriately qualified inspection techniques.

Virginia Power Response:

There are only four (4) tubes containing indications noted since the 1995 inspections that currently remain in service that fit this category. Please note that the 24 percent throughwall (TW) indication was caused by anti-vibration bar (AVB) wear and the largest remaining indication suspected of being a pit is 27 percent TW. As indicated in our initial response to GL 97-05, assignment of percent TW was from the bobbin probe in accordance with the vendor practice in place at the time. Further detailed information on these indications is as follows:

Surry Unit 1

None recorded during two steam generator inspections* which included the Fall 1995 "C" S/G and Spring 1997 "A" S/G inspections.

Surry Unit 2

Winter 1995 "A" S/G Inspection*

R 7-C36:	21% TW; Tubesheet Cold + 4.5 inches
R 6-C38:	26% TW; Tubesheet Cold + 4.2 inches
	27% TW; Tubesheet Cold + 3.8 inches
R 4-C45:	13% TW; Tubesheet Cold + 3.1 inches
	26% TW; Tubesheet Cold + 2.1 inches

Spring 1996 "C" S/G Inspection*

R25-C13: 26% TW; Tubesheet Cold + 2.2 inches

Fall 1997 "B" S/G Inspection*

None Reported

*Note: During these inspections 100% full-length bobbin probe inspections were conducted per the Virginia Power inspection plan. Hence the resulting numbers of indications represent full coverage for that generator. It should be noted that indications reported in 1995 would have been reported as "axial indications" since the guidelines in use at that time did not have a "pit" category and in this case were clearly non crack-like volumetric signals as indicated from RPC (Rotating Pancake Coil) confirmation testing. They were assigned as axial indications since axial extents appeared larger. Post-outage assessments typical of that time were conducted where potentially significant eddy current results are reviewed. In this case the inspection vendor review indicated these "could be" indicative of pit-like indications. Hence, a conservative approach was taken and this category was added in the 1996 inspection analysis guideline. It included specific screening criteria to locate and define these indications should they exist.

Relative to the request regarding disposition of these indications as required by the unit's Technical Specification requirements, growth data were derived from bobbin data from the baseline inspections through the 1995 and 1996 inspections indications, with one exception. None of the baseline indications exhibited growth of any concern and, hence, remain in service. The one indication in tube R6-C38 with subsequent data exhibited no growth from 1988 to 1995. As indicated in our annual report for 1995 inspections, five (5) tubes were plugged of which four contained signals similar to the tubes discussed above that remain in service. Growth rates were derived with, the largest not exceeding 7% per year using maximum extents, based on data from baseline inspections and 1995 data. Even though RPC confirmation indicated non-crack-like conditions, these were conservatively plugged since the TW bobbin indications were above or near 40%.

Our basis for concluding that the indications are, in fact, pits and can be sized using appropriately qualified inspection techniques is discussed in the following paragraphs.

The appearance of these signals on the RPC terrain plot display is the primary basis for classifying the signals as pit indications. The terrain plot display shows the indications to be nearly round in shape and, thus, indicative of a volumetric condition. A pit most closely matches the features exhibited on the terrain plot for these indications. Another consideration is the location of the indications. The signals are located in an area of the generator (i.e., cold leg above tubesheet expansion transition) where pitting might be expected given supporting chemistry conditions. An internal Virginia Power review of past chemistry conditions and history was conducted to evaluate whether conditions might have existed to support pitting conditions. The results of this review indicated that under present chemistry operating conditions the tubing would be expected to have minimal susceptibility to pitting attack. A higher potential may have existed prior to the 1994 chemical cleaning due to higher levels of copper deposits being present. It should be emphasized that inspection data gathered to date continues to show this type of indication to be inactive as defined by industry guidelines. Nevertheless, we continue to monitor for the possible discovery of indications of this nature and we believe this to be a conservative approach. The Unit 2 "A" steam generator is scheduled for reinspection in the Spring of 1999 in accordance with our long term plan, and the tubes that remain in service will be reinspected with our 100% bobbin probe program with followup RPC inspections, as required by Virginia Power's data analysis guidelines.

In accordance with accepted industry practice regarding qualification of bobbin probes at the time of initial discovery of these signals, no particular issue existed relative to sizing of volumetric indications (i.e., thinning, AVB wear, fretting, and pitting). To our knowledge, no changes in the EPRI qualification database for the most recent requirements have affected the sizing ability of the bobbin probe for pit indications.