



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 11 1978

MEMORANDUM FOR: D. G. Eisenhut, Assistant Director
for Operational Technology, DOR

FROM: L. C. Shao, Chief, Engineering Branch, DOR

SUBJECT: ACQUISITION OF REPLACED STEAM GENERATOR FOR
RESEARCH STUDY

In response to your request, we have put together the following preliminary thoughts concerning which of the Westinghouse steam generators presently scheduled to be removed from an operating reactor would be most desirable for RES acquisition.

We have reviewed the conditions of the steam generators that, because of their degraded conditions, are currently scheduled to be replaced. The primary candidates for acquisition for Research purposes appear to be generator 2B of Surry Unit 2 or generator 4B of Turkey Point Unit 4. These two steam generators are the most severely degraded and exhibit all major forms of degradation that have been observed in Westinghouse steam generators.

Both Surry Unit 2 and Turkey Point Unit 4 began commercial operation within five months of each other. These two units started with a phosphate (PO₄) secondary water chemistry treatment, and subsequently were switched to an all volatile treatment (AVT). Prior to making the switches, they have experienced about the same levels of tube wastage. By 1975, steam generators in both units had experienced extensive denting. The denting continued in both Units and by 1976, complete flow slot closure and support plate cracking were observed. In September 1976, Surry Unit 2 experienced a major tube failure in one tube at the top of U-bend region. Subsequent investigation also discovered tube cracks in U-bend regions in steam generators 4B of Turkey Point Unit 4 and 2B of Surry Unit 2.

Although conditions of both candidate steam generators are about the same, we feel that the acquisition of steam generator 2B of Surry Unit 2 is more desirable for two reasons: First, Surry 2B generator contained a tube that developed a U-bend crack which led to an 80 gpm primary to secondary leak rate. Secondly, this generator is a series 51 steam generator while Turkey Point Unit 4 utilizes the model 44 generators. The series 51 steam generator has longer tubes, an additional support plate and, therefore, several thousand more tube/tube support plate intersections.

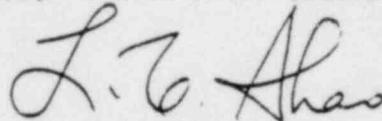
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For the previously discussed reasons the Surry 2B steam generator is preferable over the Turkey Point 4B, however, either should prove to be useful as a research tool.

In order to make such a research venture as profitable as possible, the following factors should be appropriately considered in any such research study:

1. Primary to secondary system leaks (number throughout steam generator life).
2. History of inequality of volatile chemical feed rates.
3. Distribution of pumped forward heater drains.
4. Variations in blowdown flow rate.
5. Secondary water treatment differences during startup and layup.
6. Operational differences during startup.
7. Variations in carryover.

If the NRC should undertake such a research effort, we should ensure that DOR concerns and information needs are clearly identified early in the program. We would be happy to work with research in this regard.



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