



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

Docket  
File

50-289

September 1, 1995

Mr. James Knubel, Vice President  
and Director - TMI  
GPU Nuclear Corporation  
Post Office Box 480  
Middletown, PA 17057-0480

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1) - REVIEW OF  
11R REFUELING OUTAGE STEAM GENERATOR INSPECTION PLAN  
(TAC NO. M91608)

Dear Mr. Knubel:

The NRC staff has reviewed the information submitted by GPU Nuclear Corporation (GPUN) on February 5, 1995, with respect to the inspection plan, and Technical Specification (TS) interpretation, for the TMI-1 once through steam generators (OTSG) during the 11R refueling outage. Since our letter on this subject on August 3, 1995, we have had discussions with your staff regarding Comment No. 4 in that letter. This letter clarifies our interpretation of the TMI-1 TS and supersedes our previous letter.

The proposed plan would result in eddy current inspection of 21% of the total number of tubes in each OTSG, which goes far beyond the minimum sample size of 3% required by TS 4.19. The plan also provides for predesignation of which tubes will be inspected in three elements or groups (3%, 6%, and 12%) rather than selecting tubes in a random fashion. The first sample (3%) will include a random sampling except as provided by TS 4.19.2.a. The second and third subsamples (6% and 12%) will be predesignated and will include roughly every fifth row in its entirety. By predesignating, the program should result in all tubes eventually being inspected over a period of several outages. By inspecting entire rows of tubes in the second and third sample, personnel radiation exposure will be minimized.

The staff finds your proposed inspection plan acceptable provided the following comments are addressed:

1. Each of the predesignated samples must meet the sample selection criteria specified in the Technical Specifications.
2. If a new degradation mechanism is detected, the inspection plan will need to be expanded to include inspection of additional tubes. The program provides that inservice tubes immediately adjacent to new defective tubes (and possibly those adjacent to new degraded tubes) will be inspected. The staff emphasizes that those additional tubes are to be included in the population used to categorize the inspection results as C-1, C-2, or C-3 (i.e., no free inspections).

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- 3. Interpretation paragraph 5 states "If 5 or more defective tubes ... then further results evaluation shall be done to ensure that more extensive tube inspections are not required by TS Table 4.19-2." If the inspection results are in the C-3 category for any sample (1st, 2nd, or 3rd), GPUN must inspect all tubes in that steam generator (i.e., no evaluation to determine if the inspection must be expanded).
- 4. The TMI-1 TS require eddy current testing of only the freespan portion of the OTSG tubes (i.e., from the bottom of the upper tubesheet to the top of the lower tubesheet). However, TS 4.19.2.a.2 also requires some inspection of tubes "in those areas where experience has indicated potential problems." In 1981, the sodium thiosulfate intrusion into the reactor coolant system caused massive corrosion cracking in the portion of the tubes within the upper tubesheet. To mitigate the effects of these cracks, GPUN kinetically expanded all tubes to near the bottom of the tubesheet. If future inspections indicate "potential problems" in the transition area between the expanded and unexpanded portions of the tubing, TS 4.19.2.a.2 would require additional inspections of those areas.

Sincerely,

Original signed by:

Ronald W. Hernan, Senior Project Manager  
 Project Directorate I-3  
 Division of Reactor Projects - I/II  
 Office of Nuclear Reactor Regulation

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Ronald W. Hernan, Senior Project Manager  
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