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

February 11, 1981

State of Wisconsin
Public Service Commission
Hill Farms State Office Building
Madison, Wisconsin 53702
Attention: Jerry E. Mendl

Dear Mr. Mendl:

In your letter of January 16, 1981 you presented three questions concerning radiological health and safety aspects related to possible steam generator replacement at the Point Beach Nuclear Plant and other alternative courses of action. You pointed out that these questions were raised as part of an environmental screening in response to Wisconsin Electric Power Company's application for authority for the acquisition of replacement steam generator lower assemblies and primary moisture separators for Point Beach Nuclear Plant, Unit 1, to determine if a state environmental impact statement is required.

Our response to the specific questions of your January 16 letter is as follows:

a. "For the alternatives of steam generator replacement, steam generator resleeving, and continued operation at decreased capacity (no action), how does each alternative affect the amount and kind of routine radionuclide releases and ensuing public radiation exposure?"

Since we have little operating experience to gage the effectiveness of tube sleeving as a repair mechanism we will assume that tube sleeving will yield tube integrity that can only approach that of a replaced steam generator. Either replacement of steam generators or tube sleeving would be expected to reduce the amount of routine radionuclide releases due to the anticipated increased tube integrity of new or sleeved tubes, compared to tubes that have experienced some measurable degradation due to various types of corrosion.

There currently exists some small but continuous leakage from tubes in the Point Beach Unit 1 steam generators. This leakage does not approach the limits in 10 CFR Part 20 and is kept under close surveillance. The Point Beach license imposes strict requirements to control and maintain leakage rates within allowable limits. Close surveillance of leakage is expected to continue regardless of which alternative is chosen.

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Based on the above, the ranking of alternatives as to the least amount of routine radionuclide releases would be steam generator replacement, followed by tube sleeving, followed by continued operation and tube plugging.

Finally, none of the alternatives affect the kinds of routine radionuclides released as they have no effect on the fission process.

b. "How do the above alternatives differ with respect to occupational radiation exposure?"

From data obtained from nuclear facilities conducting operations similar to the mentioned alternatives we estimate the occupational radiation exposure as follows:

* Steam generator replacement

Name	Estimated Dose	Measured Actual Dose
Surry 1	2070 man rem	**
Surry 2	2070 man rem	2140 man rem
Turkey Point 3	2100 man rem	**
Turkey Point 4	2100 man rem	**
Palisades	1519 man rem	**

Based on the above, the estimated dose for Point Beach would be about 1380 to 1520 man rem for replacement of its two steam generators.

Tube Sleeving

Southern California Edison Company (San Onofre 1) estimated a total occupational dose of 1800 man rem for the 7,000 steam generator tubes to be sleeved. Based on Point Beach's estimate of an upper limit of 4,800 steam generator tubes as potential candidates for sleeving, the estimated dose would be about 1,230 man rem.

Continued Operation

Point Beach's last steam generator inspection and tube plugging yielded an occupational dose of 33.6 man rem. We feel this is a representative

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* The Surry and Turkey Point estimates are for three steam generators, the Palisades estimate for two steam generators.

** Actual occupational exposure is unavailable as the steam generator replacement has not yet been performed.

number for future inspections and resulting tube plugging. Assuming an average of two steam generator inspections per year over the next ten years the total dose from these inspections and any associated tube plugging would be about 670 man rem.

In conclusion, estimated doses for the three alternatives are:

steam generator replacement	1380 - 1520 man rem
tube sleeving	1230 man rem
continued operation (no action)	670 man rem

Copies of the radiological evaluations for steam generator repair or replacement at the nuclear facilities previously mentioned are included for your information. The following general conclusions were reached in these reports:

"In each case the plants in question took steps to ensure occupational exposure was less than the limits set forth in 10 CFR Part 20 and was maintained as low as reasonably achievable. The estimated doses were reasonable and fell within the normal range of occupational doses (i.e. radiation exposures) observed in recent years. The additional health risks due to these doses over normal risks were quite small, less than one percent of normal risks to the project work force as a whole. The doses to the work force as a whole and to the average worker will be within the variations in lifetime doses due to natural background radiation in the U.S."

c. "If the no action option is chosen, is the risks of, or possible severity of an accident increased as the number of plugged steam generator tubes increases from 12% to 30%?"

To increase the allowable number of tubes plugged in a steam generator beyond the current limit of 18% would require a license amendment request from Wisconsin Electric Power Company and an accompanying safety evaluation. An analysis of the emergency core cooling system performance would be submitted by the licensee and would require our approval for the new plugging limit. We have reviewed the applications for increasing the plugging limit of the Turkey Pont Units 3 and 4 steam generators to 25% of total tubes plugged, the Point Beach Unit 1 steam generators to 18% of total tubes plugged and Surry Units 1 and 2 steam generators to 28% of total plugged. The conclusions reached in these analyses were that the increase in plugging limits "does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin". It is our belief, therefore, that as long as the required analyses are performed and acceptance criteria met, the risk or severity of an accident would not be increased as the number of steam generator tubes plugged increases from 12% to 30%.

We hope we have satisfactorily answered your questions and are including copies of the environmental assessments referenced in this letter for your information. If you have any questions, please contact T. G. Colburn at (301) 492-8129.

Sincerely,

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

Enclosures:
1. NRC letter to SCE, dated November 28, 1980
2. NRC letter to VEPCO, dated January 20, 1979
3. NRC letter to VEPCO, dated May 9, 1979
4. NUREG-0692
5. NRC letter to FPL, dated June 12, 1980
6. NUREG-0743
7. NUREG-0756
8. NUREG/CR-1595 PNL-3454

cc: w/o enclosures
See next page

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