PSNH PUBLIC SERVICE
Company of New Hampshire

SEABROOK STATION
Engineering Office:
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April 13, 1982

SBN-256
T.F. B 7.1.2

United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. Frank J. Miraglia, Chief
Licensing Branch #3
Division of Licensing

References: (a) Construction Permits CPPR-135 and CPPR-136, Docket Nos. 50-443 and 50-444
(b) USNRC Letter, dated March 5, 1981, "Request for Additional Information," F. J. Miraglia to W. C. Tallman

Subject: Response to RAI 491.1; Core Performance Branch

Dear Sir·

We have attached a response to the subject RAI which you forwarded in Reference (b).

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

Allen P. Legendre Jr.

for: John DeVincentis
Project Manager

Attachment

3001
S1/1

QUESTION 491.1

It is noted that your incore neutron flux measurement instrumentation is different from previous Westinghouse design in that it incorporates, in addition to a moveable detector, a set of fixed detectors. So that we can understand the significance of this change, please provide information on the following:

1. Describe the geometrical details of the incore part of the system and indicate differences from previous Westinghouse designs.

2. If details related to the moveable detectors, their environment, output or operation are different from previous design, what information has been developed to assure accuracy and reliability of operation?

3. Are any differences from previous Westinghouse reactor operation contemplated for the use of or requirements (including Technical Specifications) for the moveable system?

4. What uses and/or requirements are contemplated for the fixed detector system? Will it be associated in anyway with safety analyses, e.g., via LCO monitoring, or calibration of or substitution for other instrumentation, e.g., substitution for required moveable detector readings? If so, full details relating to use, related calculations, accuracy and reliability are required.

RESPONSE TO QUESTION 491.1

Although Seabrook incore neutron flux instrumentation incorporates a set of platinum self-powered fixed detectors in addition to a moveable detector, it is functionally similar to the previous Westinghouse design. The seabrook moveable detector performs the same function that moveable detectors perform on plants with the previous Westinghouse design.

1. The Seabrook moveable detector is functionally identical to the moveable detectors previously used, and is similarly constructed. However, the Seabrook moveable detector is smaller in diameter than those used previously and, therefore, outputs a smaller current. Although the absolute current output is smaller, the electronics have been adjusted to accept this smaller current and the overall system has a performance which should be comparable to that of the previous Westinghouse design.

2. As was stated above, the output of the Seabrook moveable detector is smaller than that of the detectors used previously but the overall system performance should be comparable to that of the previous Westinghouse design.

   The addition of the fixed detectors to the environment of the moveable detector is not detrimental to the performance of the moveable detector because the effect of the platinum self-powered fixed detectors on the output of the moveable detector should be essentially negligible.
   There is an ongoing test program to assure reliability of the system.

3. No differences from previous Westinghouse reactor operation are contemplated for the use of, or requirements for, the moveable system.

4. Seabrook Station will be initially operated as a standard Westinghouse reactor. During this period, data will be accumulated on the performance (including accuracy and reliability) of the fixed detector system. Ultimately, the fixed detector system will be used to monitor LCO requirements on linear heat generation rate. This will allow some relaxation of the target band in Constant Axial Offset Control.

   Safety analysis methodology to support wide-band CAOC operation is currently being developed. This will be used to verify that LCO's for normal operation can be met and to verify reactor protection provided by the setpoints of the high flux trip, the Overpower ΔT trip, and the Overtemperature ΔT trip.

   Prior to wide-band CAOC operation, a proposed license amendment with supporting analysis will be submitted.