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

JAN 10 1980

Docket No. 50-339

Virginia Electric and Power Company
ATTN: Mr. W. L. Proffitt
Senior Vice President Power
P.O. Box 26666
Richmond, Virginia 23261

Dear Mr. Proffitt:

SUBJECT: Environmental Qualification of Rosemount Transmitters - North
Anna Power Station, Unit 2

In the Final Safety Analysis Report, you reference Rosemount Report 117415 and additional tests conducted by you as the basis for the environmental qualification of Rosemount transmitters for the North Anna Power Station, Unit 2. We have reviewed the information provided by you and our evaluation of your qualification program for the Rosemount transmitters is summarized in Enclosures 1 and 2. It is our conclusion that while these tests demonstrate that these transmitters have a high degree of tolerance to harsh environments, supplemental tests should be conducted to confirm the assumptions used in this program. Our requirements for resolution of these concerns for the North Anna Power Station, Unit 2 are presented in Enclosure 1.

Please inform us after receipt of this letter of your schedule for providing the information in Enclosure 1 and your intent with regard to our requirements as stated in Enclosure 1.

Sincerely,

Olan D. Parr
Olan D. Parr, Chief
Light Water Reactors No. 3
Division of Project Management

Enclosures:
As stated

cc: See attached page

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Mr. W. L. Proffitt

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QUALIFICATION OF ROSEMOUNT MODEL 1152 TRANSMITTER
FOR NORTH ANNA UNIT 2

On November 20, 1979, we met with representatives of VEPCO to discuss two additional tests which VEPCO had conducted on Rosemount 1152 transmitters. These tests are in addition to those covered by Rosemount Report 117415 and both are referenced in the North Anna 2 application as the qualification basis for safety related transmitters. VEPCO submitted the information on the additional testing for the qualification of these units by letter dated December 19, 1979. Enclosure 2 is an evaluation of the Rosemount test report which was made based on the guidelines in NUREG-0588, "Staff Interim Position on Qualification of Class IE Electrical Equipment." As noted therein, we concluded that this information by itself does not provide an adequate level of assurance for the qualification of these transmitters.

The objective of our meeting with VEPCO was to determine if the additional tests conducted by VEPCO were sufficient to resolve the concerns outstanding from our review of the Rosemount test report. Based upon the additional information provided by VEPCO, the following concerns were partially resolved:

1. The additional tests conducted by VEPCO were conducted at the Westinghouse test facility and included the use of steam to obtain the initial simulation of the accident environment. Based on the test results, this removes the concern that the Rosemount tests had used electrical heaters and pressurization with air or nitrogen to simulate the initial portion of the simulated accident environment.

2. The maximum instrument errors were -8 percent, which are within the acceptance limits Westinghouse has established for transmitters in the Westinghouse supplemental qualification program. This in part, resolves our concerns for instrument errors. Further concerns are noted below.
3. The radiation dose used in the Rosemount test program was 5×10^5 Rads. VEPCO data indicates that the dose at the transmitter location will not exceed this value until 200 hours after a LOCA, consideration of the dose received prior to the accident. These instruments would be used well beyond this period of time to provide important information for post accident conditions. Thus, they should be qualified for radiation levels equivalent to the service conditions for their applications. This concern remains an open item.
4. The subsequent tests included a test of the electrical connection seal, therefore, this concern has been satisfied.
5. The subsequent tests included caustic sprays, therefore, this concern has been satisfied.

Of the concerns from our review of the Rosemount test report, (Enclosure 2) all have been addressed by the additional tests conducted by VEPCO except for the following:

1. The thermal cycling tests included in the Rosemount test report were an attempt to address aging considerations. We find that this alone is not adequate to demonstrate that aging need not be addressed further. However, we do have an outstanding question on equipment qualifications for North Anna 2 to investigate materials which may be subject to known aging effects. Rosemount transmitters should be considered in this response.

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2. The additional steam environment tests conducted by VEPCO utilized transmitters which had not been subjected to the effects of radiation. Although the original Rosemount tests had included exposure to radiation prior to the steam environment tests, these results gave an instrument error of approximately - 12% at 30 minutes into the test. This value by itself exceeds the acceptance criteria used in the Westinghouse supplemental qualification program. Thus, there is the concern that the additional effect of radiation could lead to greater instrument errors than shown by the additional VEPCO tests. Westinghouse test experience with the Lot 1 Barton transmitters shows that there is such a relationship. We conclude that additional tests are required to be conducted to demonstrate that transmitters will respond within the acceptance limits for measurement errors where exposed to the combined effects of radiation and high temperatures.
3. The Rosemount report concludes that the results conducted on one transmitter are valid for all pressure and differential pressure transmitters by similarity. While it may be valid to conclude that the instrument will not fail outright, it does not provide an acceptable basis to make conclusions with regard to instrument errors. We conclude that additional tests are required to be conducted to demonstrate that each type of transmitter used will meet the acceptance requirement when exposed to the effects of radiation and high temperatures. A further consideration with respect to instrument errors is the effect that the use of different measurement span limits may have due to the requirements of a specific application. The Rosemount tests did not address this

consideration. We conclude that additional tests are required to be conducted to demonstrate that instrument span adjustments required for specific applications do not result in measurement errors in excess of the acceptance limits when the transmitters are exposed to the effects of radiation and high temperatures.

If the results of the above confirmatory tests provide data which is consistent with the assumptions made with respect to the adequacy of environmental qualification of these transmitters, we would find that these transmitters are acceptable.

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