

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

August 4, 1982

R. H. LEASBURG
VICE PRESIDENT
NUCLEAR OPERATIONS

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
Attn: Mr. Robert A. Clark, Chief
Operating Reactors Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Serial No. 460
NO/JHL,DWL:acm
Docket No. 50-339
License No. NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNIT NO. 2
EVALUATION OF RCS PIPING THERMAL SLEEVES

The purpose of this letter is to provide the details of the examinations and evaluations performed by Vepco, Westinghouse Electric Corporation, and Stone and Webster Engineering Corporation regarding thermal sleeve problems that were identified in the North Anna Unit No. 2 Reactor Coolant System (RCS) piping. Attachment 1 provides a description of the thermal sleeve problem at North Anna Unit No. 2 and the detailed evaluation of the safety aspects of operation with the affected thermal sleeves. Attachment 2 provides the inspection results of the Ultrasonic Testing (UT) and Radiographic Testing (RT) which was conducted to verify the status of the North Anna Unit No. 2 thermal sleeves of the suspect design (including three additional thermal sleeves not suspected to be a problem).

Vepco will remove the four affected thermal sleeves, that were indicated in Attachment 2, prior to heatup on Unit 2, which is currently scheduled for August 9, 1982 with the unit scheduled on-line by August 12, 1982.

Since North Anna Unit 2 plans to continue power operation with four thermal sleeves of similar design still in-place, Vepco will initiate a program of increased operator training and awareness as well as a program of increased surveillance to address the potential concerns of loose parts in the RCS. Attachment 3 provides a description of these programs and a description of a temporary, supplemental Loose Parts Monitoring System to be installed to monitor the remaining four thermal sleeve locations until the removal of the thermal sleeves.

As indicated in the attached Westinghouse safety evaluation (Attachment 1), the possibility exists for the 14 inch thermal sleeve on the loop end of the pressurizer surge line to damage the Resistance Temperature Detector (RTD) scoops and the RTD thermowell in the loop C hot leg if it becomes loose. Shearing of the hot leg RTD thermowell would create a leak (categorized as a large leak, Condition II event) in the RCS. This occurrence would not significantly degrade the RCS pressure boundary. Attachment 4 provides the safety evaluation regarding the potential for missile generation and jet impingement resulting from the loss of the hot leg RTD thermowell. Vepco does

Acc!

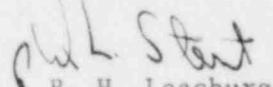
8208060220 820804
PDR ADOCK 05000339
P PDR

VIRGINIA ELECTRIC AND POWER COMPANY TO Harold R. Denton

not intend to remove the intact 14 inch surge line thermal sleeve at this time since the UT and RT inspection results indicate the sleeve is intact. In addition, the removal would require a full core off-load due to the particular configuration of the loop C hot leg and surge line connection. Operator awareness and the LPMS will monitor this thermal sleeve location.

If you have any questions regarding the details of the examinations and evaluations provided by this letter or on the schedule for removing the loose thermal sleeves and plant startup, please contact us at your earliest convenience.

Very truly yours,


R. H. Leasburg

cc: Mr. James P. O'Reilly
Regional Administrator
Region II

ATTACHMENT 2

NORTH ANNA UNIT NO. 2

THERMAL SLEEVE UT AND RT INSPECTION RESULTS

THERMAL SLEEVE UT AND RT INSPECTION RESULTS

NORTH ANNA POWER STATION UNIT NO. 2

<u>NOZZLE</u>	<u>LOOP</u>	<u>UT RESULTS</u>	<u>RT RESULTS</u>
2" Loopfill*	A	None	intact
2" Loopfill*	B	None	intact
2" Loopfill*	C	None	intact
3" Charging	B	sleeve in-place	Welds cracked/40° rotation
6" Safety Injection	A	sleeve in-place	intact
6" Safety Injection	B	sleeve in-place	intact
6" Safety Injection	C	sleeve in-place	Welds cracked/5° rotation
12" Accumulator Discharge	A	sleeve in-place	intact
12" Accumulator Discharge	B	sleeve out-of-place	Welds cracked/Sleeve dropped 4 1/2"
12" Accumulator Discharge	C	sleeve in-place	Welds cracked/Sleeve dropped 1/8"
14" Pressurizer Surge Line**	C	sleeve in-place	intact

* The 2" nozzles were later identified as having a different design.

** Loop end of pressurizer surge line.

ATTACHMENT 3

NORTH ANNA UNIT NO. 2

LOOSE PART SURVEILLANCE PROGRAM

OPERATOR GUIDANCE

The control room operators for North Anna Unit No. 2 will be instructed prior to and during plant startup of the potential for loose parts in the RCS resulting from whole or fragmented thermal sleeves. Use of the Loose Parts Monitoring System (LPMS) will be reviewed as well as the existing and additional loose parts surveillance activities. Specific instruction will be provided by Westinghouse in the use of the supplemental LPMS which is being installed to specifically monitor the remaining thermal sleeve locations.

SURVEILLANCE

The LPMS will be functionally tested at least once every 31 days. Audible checks of the LPMS are being performed by the Shift Technical Advisors on a daily basis. This is a new surveillance.

Control rod exercises will be performed on a weekly basis to verify the free movement of the control rod assemblies. Technical Specifications require this activity on a monthly basis.

Reactor coolant activity will be monitored at least once per 72 hours to detect any potential clad damage due to fretting by loose part fragments. Technical Specifications require this activity on a bi-monthly basis.

Incore instrumentation thimbles will be verified as operable by traversing the movable incore detectors in the lower vessel region on a weekly basis. This should identify any potential damage or deformation of the instrument thimbles by a loose part in the vessel lower internals area. This is a new surveillance.

SUPPLEMENTAL LPMS

Veeco is installing a temporary supplemental Loose Parts Monitoring System (LPMS) on North Anna Unit 2 to monitor thermal sleeves remaining in the reactor coolant system. This supplemented LPMS will remain in service until such time that removal of all suspect thermal sleeves is accomplished.

The supplemental LPMS for Unit 2 consists of installing accelerometers to be located on Loops A and B cold leg between the 12-inch accumulator discharge line and the reactor vessel. It will not be necessary to install a LPMS on Loop C cold leg since all thermal sleeves of concern have been taken out. Another accelerometer is to be located on the Loop C hot leg between the 14-inch surge line and the loop isolation valve.

Associated with each accelerometer is a preamplifier which is located as close to the accelerometer as possible in order to obtain the best signal response. Veeco plans to install all accelerometers one to two feet down-stream from the thermal sleeves to be monitored in order to obtain the best signal response. The location of these accelerometers was recommended by Westinghouse.

In the control room, a Westinghouse control cabinet will provide continuous alarm monitoring. This supplemented LPMS for the thermal sleeves is similar to the existing LPMS at North Anna.

ATTACHMENT 4

SAFETY EVALUATION FOR POTENTIAL MISSILES AND JET IMPINGEMENT

NORTH ANNA UNIT NO. 2

The investigation of the possible effects of jet impingement and missile impact due to a break at the temperature element (TE-2433) in the Reactor Coolant "C" loop hot leg has been analyzed. The potential targets in the vicinity of this instrument, as established by requirements in Standard Review Plan 3.6.2, are the steam generator insulation blanket and the north wall of the "C" cubicle. A field investigation has indicated that there are no safety related equipment, pipes or cables located in the area which would be affected by jet impingement or missile impact due to the temperature element connection failure. Therefore, the jet impingement load and missile impact due to the break at the temperature element connection will not debilitate equipment required for the safe shutdown of the plant.

ATTACHMENT 1

NORTH ANNA UNIT NO. 2

LOOSE THERMAL SLEEVE SAFETY EVALUATION