TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

December 19, 1980

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

PHIPPS BEND NUCLEAR PLANT UNIT 1 - REPORTABLE DEFICIENCY - RPV SHROUD HEAD AND MOISTURE SEPARATOR ASSEMBLY FIRE (NCR PBNP 106)

Initial notification of the subject deficiency was made to NRC-OIE, Region II, Inspector R. W. Wright on June 13, 1980. The first interim report was submitted on July 14, 1980, followed by our second interim report on September 23, 1980. In compliance with paragraph 50.55(e) of 10 CFR Part 50, enclosed is the final report on the subject deficiency. If you have any questions, please call Jim Domer at FTS 857-2014.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc: Mr. Victor Stello, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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PHIPPS BEND NUCLEAR PLANT UNIT 1
REACTOR PRESSURE VESSEL SHROUD HEAD AND
MOISTURE SEPARATOR ASSEMBLY FIRE
10CFR PART 50.55(e) REPORT NO. 3 (FINAL)
NCR PBNP-106

On June 13, 1980, TVA notified NRC-OIE, Region II, Inspector R. W. Wright, of a potentially reportable condition under 10CFR50.55(e) regarding a fire which was ignited in and around the Phipps Bend unit 1 reactor pressure vessel (RPV) shroud head and moisture separator assembly (MS assembly).

This is the final report on the subject reportable condition.

Description of Deficiency

In the process of shipping the Phipps Bend unit 1 vessel and RPV MS assembly to the site, personnel of the VSL Corporation, Los Gatos, California, (the hauling contractor) attempted to remove lugs near the RPV MS assembly shipping crate by arc air gouging and inadvertently ignited the shipping crate. The fire partially consumed the shipping crate and tarpaulin and burned and/or melted the polyethylene cover which was around the RPV MS assembly inside the crate.

The damage to the RPV MS assembly includes:

(a) Discoloration of the stainless steel due to heat and smoke.
(b) Melted polyethylene adhering to the inside and outside surfaces of the steam separators.

The GE data package on the RPV MS assembly indicates that it is made of 304 and 304L stainless steel except for the bolting assemblies which are made of Inconel and are on the periphery of the assembly. These materials would not be expected to exhibit sensitization or cracking problems due to the fire and subsequent contamination.

Safety Implications

The fire caused significant damage to the assembly in terms of contamination left thereon. This contamination could result in possible blockages of flow paths through this assembly or other components in the nuclear boiler system and, thereby, degrade the safety of operation of the facility.

Corrective Action

TVA initially hydroblasted the RPV MS assembly with demineralized water.

TVA and GE metallurgists examined the contaminated surfaces of the RPV MS assembly. They found the surface contamination of "free Halogens" to be low (less than the RDT 0.08 mg/dm^2 acceptance criteria). Random liquid penetrant examination of several of the moisture separator tubes which appeared to have the most severe (worst case) heat damage showed no indication of cracking. In situ metallographic examination of two random worst case locations disclosed no evidence of sensitization in these areas.

TVA and GE removed three samples or test coupons (two from the worst case discoloration locations and one from a clean area for comparison) for additional laboratory examination and tests by GE in their San Jose, California, laboratory.

TVA and GE analyses of the coupons have disclosed no evidence of sensitization. Therefore, no tubes will have to be replaced. The areas where the samples were removed will have rough edges blended and smoothed following the cleaning process described below. A liquid penetrant examination of the blended areas will be performed to determine if additional smoothing is required.

A cleaning procedure has been developed and approved by GE and TVA. The major steps to be taken in cleaning the assembly are as follows:

1. Vacuum loose debris from separator vane assembly.

2. Trim off heavy concentrations of melted plastic taking care not to scratch surfaces.

3. Steam clean entire assembly.

4. Visually inspect for soils, foreign materials, and/or damage.

5. Wipe off miscellaneous debris with acetone.

6. Identify and record any isolated areas where contaminants cannot be removed in 1 through 5. (Acceptance of these areas "as is" shall be subject to both GE and TVA approval.)

7. Determine residual contamination on the separator (S/N A3426) most adversely affected by the fire and a minimum of three other areas randomly selected by swabbing these identified areas and analyzing contamination picked up.

8. Total chlorides, lead, sulfur, and fluorides must be less than 20 milligrams per square foot of surface area.

9. If condition 8 is not met, repeat cleaning and retest a selected area for contamination to meet condition 8.

10. Soak entire assembly in a TSP-inhibited solution for 48 hours minimum to remove residual contaminants in crevices. Remove assembly and dry all surfaces.

GE has further agreed to provide justification (for use of the assembly) for any areas of residual contamination remaining on or in the assembly upon completion of the cleaning process. GE has expressed the opinion that, ". . . residual polyethylene (if any) that might be left after completion of cleaning per this procedure will not affect operation or safety of the unit."

Final dimensional verification will be performed and the assembly will be repackaged and protected from further damage. TVA anticipates completion of its corrective actions by May 1, 1981.