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SUBJECT: Requests approval of revised Relief Request RRPT-2 for ISI Pressure Test Program.

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OCT 10 1996

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SUSQUEHANNA STEAM ELECTRIC STATION
REQUEST FOR APPROVAL OF REVISED RELIEF
REQUEST NO. RRPT-2 FOR THE ISI PRESSURE
TEST PROGRAM
PLA-4517 FILE R41-2

Docket Nos. 50-387
and 50-388

Pennsylvania Power & Light Company requests the approval of the attached revised Relief Request No. RRPT-2 for our ISI Pressure Test Program for Susquehanna SES Units 1 and 2. Relief Request No. RRPT-2 was revised as a result of conversations with the NRC Staff. The relief request was revised (1) to address CRD housing flange bolting connections only, (2) to add commitment to GE SIL 483 and (3) to add a commitment to continue VT-1 examinations of CRD bolts during disassembly of CRDs.

If you have any questions, please contact Mr. C. T. Coddington at (610) 774-7531.

Very truly yours,


R. G. Byram

Attachment

copy: NRC Region I
Mr. K. Jenison, NRC Sr. Resident Inspector
Mr. C. Poslusny, NRC Sr. Project Manager

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RRPT-2

I. RELIEF REQUEST APPLICABILITY

- A. Units: 1 and 2
- B. Code Examination Category: N/A
- C. Code Item Number: N/A
- D. Code Reference: ASME Section XI (1989 Edition), Paragraph IWA-5250(a)(2), Corrective Measures

II. IDENTIFICATION OF COMPONENTS

ASME Section XI Class 1 CRD Housing flange bolted connections with leakage identified during pressure testing. This bolting is as specified in Table IWB-2500-1, Examination Category B-G-2, Item Number B7.80.

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

The 1989 Edition of ASME Code Section XI paragraph IWA-5250(a)(2), stating:

“The source of leakages detected during the conduct of a system pressure test shall be located and evaluated by the Owner for corrective measures as follows:

If leakage occurs at a bolted connection, the bolting shall be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100.”

IV. BASIS FOR RELIEF

Leakage from the control-rod-drive-to-housing bolted connection during the system pressure test generally decreases and stops with vessel heatup at operating pressure. Evaluation of this leakage is done in accordance with the guidelines of the General Electric Co. Control Rod Drive System Operation and Maintenance Instructions GEK-73594 (for Unit 1) and GEK-83270 (for Unit 2). Should significant leakage from this bolted connection persist, it would be detected by the leakage collection system (drywell sump) serving this equipment, be investigated, and be corrected. For those cases that do not require O-ring replacement based on the above evaluation, relief from removal of CRD bolts is requested as explained below.

Removal of all bolting from a leaking control-rod-drive-to-housing bolted connection beneath a reactor vessel loaded with fuel could cause significant equipment damage, as described below. Disturbing of the seal at the bolted connection could necessitate lowering of the drive for replacement of the special O-ring seals on the flange. Lowering of the drive requires it to be uncoupled from its control rod. With the reactor head on (following completion of the ASME Class 1 System Leakage or Hydrostatic Test), the possibility exists that the drive might not recouple to its control rod; and the reactor might then have to be disassembled again to accomplish recoupling. When attempting to reinsert and recouple the drive to its control rod, three types of damage to the mechanism could occur:

- 1) The uncoupling rod in the top of the CRD can become bent;
- 2) One or more spud fingers in the top of the CRD can become bent; and
- 3) The lock plug in the bottom of the control rod can become bent.

At the least, significant leakage of contaminated reactor coolant would be created by the act of removing the bolting, lowering the drive, and replacing the special O-ring seals on the flange. This operation would challenge the reactor internal control-rod-to-housing metal-to-metal water seal, which has the potential to become a significant leak for draining the reactor vessel if proper seating does not (automatically) occur. Also, this additional control rod drive O-ring replacement operation beneath the reactor vessel contradicts the need to keep personnel radiation exposure As Low As Reasonably Achievable.

Removal, VT-3 visual examination, and reinstallation of all 8 bolts in any CRD flange exhibiting leakage or seepage would result in a minimum expenditure of 0.6 person rem per CRD under the optimum condition of restraining the CRD in position -- if lowering of the drive were not necessary. The hardship of this personnel radiation exposure is without any compensating increase in nuclear safety because the CRD flange bolted connection is designed with considerable safety margin. (Total capacity of all 8 bolts is established by Susquehanna FSAR paragraph 4.6.2.1.2.2.3 as 118,400 pounds; compared with total load of 45,000 pounds, at the 1,250 psi. reactor design pressure. Accordingly, the capacity of 5 of the 8 bolts is in excess of the load requirements for the connection, when at design pressure.)

This CRD flange bolting must receive VT-1 visual examination whenever any CRD is disassembled, per paragraph IWB-2500 and the recommendations of GE SIL 483, "CRD Cap Screw Crack Indications." Satisfaction of this periodic inspection requirement ensures periodic monitoring of this bolting for evidence of corrosion; and replacement, whenever warranted, as CRD's are regularly changed out during refueling outages. These CRD changeouts are done at the rate of approximately 20 (of the total 185) CRDs per outage. Thus, approximately 160 CRD flange bolts have been VT-1 visually examined in each of the past outages. In this way the proposed alternative provides an acceptable level of quality and safety.

V. ALTERNATE PROVISIONS

If leakage occurs at a control-rod-drive-to-housing bolted connection, the bolting shall be examined in place under tension. All accessible surfaces of the bolting shall be VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100.

The recommendations of GE SIL 483 Rev. 2 will be followed as a minimum. A VT-1 visual examination will continue to be done whenever any CRD is disassembled per paragraph IWB-2500.

