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PSNH PUBLIC SERVICE
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SBN-327
T.F. Q 2.2.2

United States Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Attention: Mr. Richard W. Starostecki, Director
Division of Resident and Project Inspection

References: (a) Construction Permit CPPR-135 and CPPR-136, Docket Nos. 50-443 and 50-444
(b) Telecon of August 20, 1982, J. DeVincentis (YAEC) to Walter Baunack (NRC Region I)

Subject: Final 10CFR50.55(e) Report; Robertshaw Controls Thermostatic Valves

Dear Sir:

On August 20, 1982, a reportable 10CFR50.55(e) item was reported [Reference (b)] regarding a potential failure mode for certain Robertshaw Controls thermostatic valves which could result in overcooling of the diesel generator engine jacket cooling water system and subsequent engine damage. This item was reported to the NRC by Colt Industries on May 25, 1982, and June 28, 1982, pursuant to 10CFR21.

The following information is provided per 10CFR50.55(e)(3) and is considered to be the final report on this item.

DESCRIPTION OF DEFICIENCY

Diesel generator sets manufactured by Colt utilize a Robertshaw Controls thermostatic valve in the Jacket Water Cooling System. These valves incorporate an overrun assembly which absorbs excessive movement of the thermal assembly. The overrun length is set by an axial bolt and nut. If the nut is not secured in place, and is able to backoff the bolt, the overrun assembly allows an increase in valve stroke. This additional valve stroke makes the thermal assembly control at a lower temperature.

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ANALYSIS OF SAFETY IMPLICATIONS

Colt engineers have determined that for this valve failure mode, extreme overcooling with attendant risk of engine damage could occur with low raw water supply temperatures. The Seabrook D-G sets will utilize the Service Water System for removing heat from the Engine Jacket Cooling Water System. The jacket water heat exchangers are designed to provide jacket cooling water at 110° with 90° service water, based on rated load operation. At reduced load, and with colder service water, a control valve malfunction could indeed cause overcooling in the engine, and a possible engine failure could constitute a substantial safety hazard. However, it is expected that this type of valve malfunction would be detected and corrected during periodic testing and maintenance operations.

CORRECTIVE ACTIONS

When this problem was first reported, the overrun assembly design called for the nut to be staked in place. The design was revised by Robertshaw Controls to require soldering the nut to the bolt. This design change was not backfitted to previously manufactured overrun assemblies, so that some assemblies with the staked construction were supplied for nuclear plant D-G sets after the design change was made.

Colt has advised Robertshaw that the solder used to secure the nuts may be affected by certain corrosion inhibitors used in Jacket Cooling Water Systems. Robertshaw, therefore, has determined that overrun assemblies utilizing swagged locking should be installed as replacements in all suspect D-G sets.

Procedures for the replacement of the overrun assemblies and documentation sign-off sheets are being prepared. Information relative to availability of replacement assemblies is also being developed. The replacement parts will be supplied by Robertshaw on a no-charge basis. The parts shipments will be accompanied by instructions, and sign-off sheets. After replacement work is done, the completed sign-off sheets will be returned to Robertshaw and Colt, so that close-out actions can be recorded and reported to NRC.

ANALYSIS AND EVALUATION

If the control valve malfunction described above was undetected and/or uncorrected, overcooling of the diesel engine could occur, with attendant risk of engine damage. However, this type of valve malfunction would be evident during periodic testing of the D-G sets, and appropriate corrective action would be taken.

The corrective actions described by Colt and Robertshaw will preclude potential problems resulting from malfunction of the overrun assembly in the thermostatic valves. Installation of the replacement assemblies provided by Robertshaw will eliminate this potential problem.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

J. DeVincentis
Project Manager

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