



Pennsylvania Power & Light Company

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NOV 19 1982

Mr. R. C. Haynes
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

SUSQUEHANNA STEAM ELECTRIC STATION
10CFR21 REPORT, DEFECT IN BASIC COMPONENT:
STRESS CORROSION CRACKING OF BRASS TUBING
IN EMERGENCY DIESEL GENERATOR INTERCOOLERS
ER 100450 FILE 526 M-30, 841
PLA-1400

Docket Nos. 50-387
and 50-388

Dear Mr. Haynes:

This letter serves to provide the Commission with the report required by 10CFR21 relating to the subject defect. Mr. R. M. Harris of PP&L originally reported this defect by telephone to Mr. E. B. McCabe of NRC Region I on November 16, 1982.

A defective condition has been found in the intercoolers installed on the diesel generators which supply emergency AC power to safety systems at the Susquehanna nuclear site. The intercoolers were provided as part of the diesel generator procurement by Cooper Energy Services, Grove City, PA. They were fabricated by McQuay-Perfex, Inc., Energy Systems Division, Berlin, WI. The Perfex part number is 500-L-168. Nine of these intercoolers were supplied to PP&L, two on each of the four diesels, and one spare.

The intercoolers are air to water heat exchangers whose primary function is to remove the heat of compression from combustion air supplied by the diesels turbocharger. They also warm the combustion air to assist in startup during cold weather. The brass tubing used in the intercoolers has experienced stress corrosion cracking from the water side following exposure to service environments. Water entering the intake air manifold of a shutdown diesel would accumulate in the intake air manifolds and cylinders under normal circumstances. However, SSES is currently operating with the petcocks at the bottom of the intercooler open, thus preventing accumulation of water. Extreme leakage during diesel operation may affect power output. Therefore, this condition has the potential to threaten the availability of the site's emergency AC power supplies. Given the design of the intercoolers and the mode of failure, extreme leakage is not expected.

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The condition of the tubing was discovered during failure analyses being performed on intercoolers submitted to the vendor for retubing earlier this year. The first intercooler sent out for retubing, which had failed in the cooling section, was examined in August. Stress corrosion cracking was found not only on the single failed tube but on other tubing removed from the cooler. In addition, it was discovered that aluminum brass had been used for an undefined number of tubes rather than the specified admiralty brass. Both alloys had experienced stress corrosion cracking; the leaker was aluminum brass.

The second intercooler, which had failed in the heater section, was examined in both the heating and cooling sections during September and October. These more extensive examinations showed that stress corrosion cracking affected both the heating and cooling sections. Ammonia was identified as the most likely corrodent. These examinations again showed that substitution of aluminum brass for admiralty had occurred. Both alloys had been about equally corroded in the heating section.

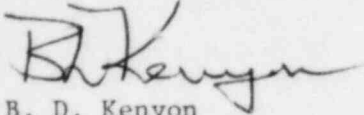
The following corrective actions are being taken by PP&L.

- 1) Brass tubing is being replaced with 90/10 Cu/Ni, which has much greater resistance to ammonia stress corrosion cracking. To date, six intercoolers with 90/10 Cu/Ni tubing have been procured and five have been replaced. Three others have been sent to the vendor for retubing. The last three intercoolers are scheduled for shipment by 12/17/82 and will be replaced shortly after receipt.
- 2) Diesel generator jacket water systems have been drained, flushed, and refilled with fresh inhibitor containing a biocide. The jacket water provides heat to the intercooler heating sections. The biocide was added to control microbiological activity which may have generated the ammonia. This action was not needed to prevent stress corrosion cracking of 90/10 Cu/Ni, but was undertaken to control general corrosion and fouling.
- 3) During the time that brass-tubed intercoolers will be in service, the shells will be drained to prevent any leakage from accumulating in the intake manifold, and the intercoolers will be checked for leakage (by observing whether water is flowing from the shell drains) once per shift.

PP&L has no information on the number, location or service conditions of brass-tubed intercoolers other than those supplied to Susquehanna. PP&L is

not in a position to provide advice related to this condition to others who may use brass-tubed intercoolers.

Very truly yours,



B. D. Kenyon
Vice President-Nuclear Operations

RMH/mks

cc: Director
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