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LOWELL E. ROE

Vice President
Facilities Development
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Mr. James G. Keppler
Regional Director, Region III
Directorate of Regulatory Operations
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

This letter is submitted in accordance with 10CFR50.55(e) as a consummation of the Interim Report dated October 24, 1975 regarding the deficiency concerning the emergency diesel generator jacket cooling water heat exchangers for Davis-Besse Nuclear Power Station Unit 1.

Description of the Deficiency

The subject heat exchangers were received on site April 25, 1974 from Bruce GM in a condition suitable for long-term storage; i.e., the nozzles were adequately covered to prevent the entry of foreign matter. The heat exchangers were placed outdoors on dunnage after receipt inspection and covered with canvas to provide adequate weather protection. The receipt inspection had revealed red lead primer on the inside of the nozzles which was not acceptable.

Procedures were then developed to remove the red lead primer, and a few months after receipt of the units, the channel heads were removed to facilitate the removal of the red lead primer from the inside of the channel heads. The work crew that removed the channel heads observed that the tube sheet and tubes of each unit were in poor condition. Inspection by field engineering revealed overall corrosion and gross fouling of the tubes and channel heads due to dirt, scale, broken glass and other foreign matter.

Inspection of the subject heat exchangers also revealed that a majority of tube to tube sheet connections were not in accordance with TEMA standards as required by the specification. The TEMA standards require that the tube material extend 1/16" to 1/8" beyond the tube sheet to prevent erosion of the tube sheet due to turbulence. A small number of tube ends were found to be installed flush with or below the face of the tube sheet and a large number did not extend the minimum 1/16".

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The cause of the corrosion has been postulated to be improper handling during tests conducted at the vendor's facility and subsequent inadequate preparation for shipment. After the manufacturer's test, the carbon steel heat exchangers were apparently prepared for shipment merely by draining and taping covers over the nozzles.

The applicant believes that a high degree of tube blockage occurred during the vendor's tests due to some unidentified substance present in the cooling water used at the vendor's facility. During the shop testing, water from a closed loop cooling tower circuit was used as a heat sink. Make-up to the loop was from a city water supply. Water quality of the cooling tower loop or the city water was not recorded.

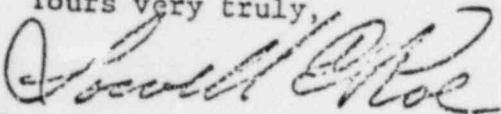
Corrective Action Taken

The heat exchangers were shipped to the manufacturer for repair. As repairs progressed, it became evident that the extent of corrosion in the tubes precluded their repair for permanent installation. There had been no permanent damage to the shell, baffles, tube sheet, etc., of the heat exchangers; therefore, the corrective action taken was to replace the tube bundles in both heat exchangers and correct the improper tube to tube sheet connections. It was felt desirable to have at least one diesel generator in operable condition for testing and operator training during the repair interim, so one heat exchanger was cleaned, judged adequate for temporary use, and shipped back to the job site for the stated use. The second heat exchanger remained at the manufacturer's facility and was later shipped to the job site fully repaired, including a new tube bundle, along with the new tube bundle for the other heat exchanger which was subsequently installed in the field. Both replacement heat exchangers were fabricated to original specifications and hydrostatically tested. All repairs have been completed.

Safety Implications

The condition of the heat exchangers was detected prior to installation and start-up testing. The tubes were fouled/corroded to such an extent that it is extremely doubtful that the diesels could have passed start-up testing without detection of the damaged condition. The full repair of the heat exchangers prior to operation of the facility and acceptable pre-operational testing of the diesels with the replacement heat exchangers in place assures that the health and safety of the public are not jeopardized.

Yours very truly,



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cc:

Dr. Ernest Volgenau, Director
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