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

83 SEP 26 A8:50

September 23, 1983

WBRD-50-390/82-82
WBRD-50-391/82-78

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - HEAT LOSS FROM POWER SYSTEMS DIESELS - WBRD-50-390/82-82, WBRD-50-391/82-78 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on July 29, 1982 in accordance with 10 CFR 50.55(e) as NCR WBN NEB 8214. Interim reports were submitted on September 3 and December 7, 1982 and March 22 and June 17, 1983. Enclosed is our final report. We consider 10 CFR Part 21 applicable to this deficiency.

If you have any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Licensing

Enclosure
cc: Mr. Richard C. DeYoung, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center (Enclosure)
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
HEAT LOSS FROM POWER SYSTEMS DIESELS
NCR WBN NEB 8214
WBRD-50-390/82-82, WBRD-50-391/82-78
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

The original published data for the Power Systems (Rocky Mount, North Carolina) diesels gave the radiated heat loss of their engine at 1.37 Btu/hp-min. Power Systems has performed a heat load test, and their data indicates the radiated heat loss of the GM-EMB 16-645E4 diesel engine to be 3.82 Btu/hp-min $\pm$ 6 percent. Power Systems notified TVA of this condition by their letter dated June 3, 1982.

The original design average maximum diesel generator (DG) engine room temperature was calculated to be 120°F based on the original published radiated heat loss value of the engine. The revised radiated heat loss value indicated that temperatures in the DG engine room will be greater than maximum equipment operating limits under certain conditions.

Safety Implications

Excessive temperatures in the vicinity of the DG electrical equipment could jeopardize the operation of the diesel and other equipment in the room. This could adversely affect the safe shutdown of the plant in the event of a loss of offsite electrical power.

Corrective Action

TVA performed heat load tests of the Watts Bar DGs on November 30, 1982, and February 23, 1983. Analysis of the test results has shown that the diesel engine radiated heat loss was 149 percent of design and was equal to 2.04 Btu/hp-min. The tests also confirmed that temperatures in the vicinity of some safety-related equipment will exceed the equipment's qualification temperatures.

TVA has issued engineering change notice (ECN) 3898 for the four DG rooms. This ECN will incorporate design changes which will assure that the DG building ventilation system can maintain acceptable temperatures (below 110°F) in the vicinity of the electrical equipment. The following changes will be made:

1. The two existing diesel engine room exhaust fans will run concurrently to cool each engine room when required by outside air temperatures.

2. A new supply fan, called the generator and electrical panel cooling fan, and associated ductwork will be added to each diesel engine room. Air supplied for these fans will be routed to the vicinity of the generator air intakes and used to help cool the electrical panels.

3. The same signal which starts the exhaust fans will also start the generator and electrical panel cooling fans.

All design work will be completed by November 7, 1983, for ECN 3893. All construction work will be completed by May 1, 1984, which is after unit 1 fuel loading. This is acceptable because excessive room temperatures do not occur, with the system in its present configuration, until the outside air temperature exceeds 86°F. Outside air temperatures above 86°F do not occur, statistically at the site, until after May 1.

To prevent recurrence of this deficiency, TVA's Division of Engineering Design (EN DES) Engineering Procedure (EP) 5.30, "Standard Format for the Preparation of Procurement Specifications," was issued in June 1977, after the DGs were procured for Watts Bar. This EP requires that vendors supply certified equipment performance data, based upon analysis or test results, at the time of equipment procurement.