

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

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May 20, 1986

WBRD-50-390/86-50
WBRD-50-391/86-47

U.S. Nuclear Regulatory Commission
Region II

Attention: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

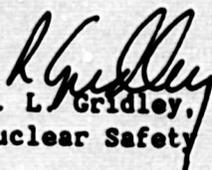
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - STANDBY DIESEL GENERATOR DESIGN
DEFICIENCY - WBRD-50-390/86-50, WBRD-50-391/86-47 - FINAL REPORT

The subject deficiency was initially reported to NRC-Region II Inspector
Gordon Hunegs on April 21, 1986 in accordance with 10 CFR 50.55(e) as SCR WBN
EEB 8633. Enclosed is our final report. We consider 10 CFR Part 21
applicable to this deficiency.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY


R. L. Gridley, Director
Nuclear Safety and Licensing

Enclosure

cc: Mr. James Taylor, 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
STANDBY DIESEL GENERATOR DESIGN DEFICIENCY
WBRD-50-390/86-50, WBRD-50-391/86-47
SCR WBN EEB 8633
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

A deficiency was identified at Watts Bar Nuclear Plant (WBN) which affects all five of the standby diesel generators (DGs) and which could prevent the DG system from performing its intended design function. During the normal shutdown cycle of a DG, a 10-minute idle period at approximately 450 r/min is initiated prior to bringing the engine to a full stop. If, during the 10-minute engine idle period, an emergency start signal is received by the DG system controls, the DG will accelerate to 900 r/min, but the generator field will not be flashed. Since this prohibits the DG from accepting load, the design does not meet the requirements of WBN Design Criteria WB-DC-40-28 nor the design bases for WBN as stated in the WBN FSAR Section 8.3.

The cause of this deficiency is a design error by the manufacturer, Morrison-Knudson, Power Systems Division, Rocky Mount, North Carolina. The generator field flash reset circuit is interlocked with a relay contact (SS2X) which closes at approximately 200 r/min when engine speed is decreasing. Since this is below the 450 r/min idle speed, the field flash circuitry would not be reset.

The DGs at WBN were procured from Morrison-Knudson on TVA procurement contract No. 74C68-83090.

Safety Implications

Since the subject deficiency affects all of the standby DGs at WBN, there is a potential for the ability to achieve and maintain a safe shutdown of the plant to be adversely affected. This could adversely affect the safety of operations of the plant.

Corrective Action

TVA will jumper relay contact SS2X from the reset function associated with relay "LR" and will disconnect the voltage shutdown pushbutton located in the control panel for each DG. This will permit the reset signal to be independent of the engine speed. The voltage shutdown pushbutton is not essential to successful DG operation. If a problem were to arise during DG operation that required immediate voltage shutdown, the emergency stop pushbutton would automatically cause the voltage to shut down as well as shutting down the engine.

TVA has issued engineering change notice (ECN) 6262 to accomplish these changes. All affected drawings have been revised and issued. All necessary hardware modifications will be completed prior to initial fuel loading for WBN unit 1.

Morrison-Knudson has notified TVA that they (Morrison-Knudson) implemented Engineering Procedure (EP) 2.02 on August 19, 1985. That procedure requires a secondary review of all safety-related design changes. The secondary review is to be performed by an independent reviewer and is an addition and improvement to Morrison-Knudson's drawing change review procedure which was previously in effect. Morrison-Knudson has notified TVA that this is adequate to prevent recurrence of the subject deficiency.