

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

October 29, 1985

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WBRD-50-390/85-45
WBRD-50-391/85-44

U.S. Nuclear Regulatory Commission
Region II
Attn: 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 - UNANALYZED DIESEL GENERATOR TRANSIENTS
FOR A BLACKOUT FOLLOWED BY A SAFETY INJECTION SIGNAL - WBRD-50-390/85-45,
WBRD-50-391/85-44 - FIRST INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
Al Ignatonis on September 27, 1985 in accordance with 10 CFR 50.55(e) as NCR
EEB 8538. Enclosed is our first interim report. We expect to submit our next
report on or about December 23, 1985.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Dome
J. W. Hufham, Manager
Licensing and Risk Protection

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
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Atlanta, Georgia 30339

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
UNANALYZED DIESEL GENERATOR TRANSIENTS FOR A BLACKOUT
FOLLOWED BY A SAFETY INJECTION SIGNAL
WBRD-50-390/85-45, WBRD-50-391/85-44
SCR WBN EEB 8538
10 CFR 50.55(e)
FIRST INTERIM REPORT

Description of Deficiency

As a result of the diesel generator (DG) C-S load study issued May 14, 1984, the control circuits of the 480V shutdown board room chiller packages that can be powered by DG 1B-B and 2A-A were modified to prevent the chillers from being connected until 40 seconds into the loading sequence (engineering change notice (ECN) 4480). In the issued study, they were then considered connected to the diesel generators exactly 40 seconds into the loading sequence. Also, the control room and electric board room air-conditioner compressors were considered connected at exactly 60 seconds into the loading sequence because they have internal timers that prevent them from being energized until 60 seconds after power returns following any interruption. The DGs were shown by vendor analysis to be within the transient voltage and frequency limits allowed in NRC Regulatory Guide 1.9 with the above loading sequence considered.

Recent review of system schematics 45W760-31-18 and -19, for a preoperational test activity, revealed a problem with these loads for the scenario of a loss of offsite power with a subsequent safety injection signal (SIS). Per design criteria WB-DC-30-1, "Emergency Auxiliary AC Power System," and section 8.3.1.1 of the Watts Bar Nuclear Plant (WBN) FSAR (page 8.3-10), if during diesel generator load sequencing following a loss of offsite power event, SIS occurs, those loads not yet connected will have their sequential timers reset and will then be sequentially loaded. This required design feature was not incorporated into ECN 4480 and is not in the control circuitry for either the chillers or air-conditioner compressors. Lack of this feature creates a potential loading condition not analyzed or tested for compliance with NRC Regulatory Guide 1.9 and does not satisfy design criteria requirements or agree with the FSAR description.

In addition, these chillers and air-conditioners are process controlled and completion of the DG sequence timing interval only enables their operation. Their actual loading on the DG can occur any time after the 40- and 60-second time delays. This also creates undefined conditions not analyzed for compliance with NRC Regulatory Guide 1.9. Similarly, this situation applies to all process-only controlled loads powered by the DGs. For example,

process-controlled loads on the 480V motor control centers, which are not tripped due to a loss of offsite power or SIS, are assumed to operate at the start of the loading sequence; however, they will operate whenever required by their process signal. Since in the DG load study these loads were considered operating at zero seconds, but they may operate at any time, this also creates a loading sequence not previously analyzed.

Safety Implications

The possibility exists that Regulatory Guide 1.9 frequency deviation (5 percent) may be exceeded if major unsequenced loads start at the same time that a large motor is sequenced on to the DG. As such, the condition is deemed to be one that, if left uncorrected, could have adversely affected the safety of operations of the plant.

Interim Progress

TVA is modifying the sequence timers and control circuitry for the 480V shutdown board room chillers, control room, and electric board room air-conditioning compressors to prevent their starting at the same time or when a large motor (500 hp class) is sequenced on. TVA is also performing an analysis to determine if any further corrective action is required.

TVA will provide a final report on this item by December 23, 1985.