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QA

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U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555

Subject: Waterford 3 SES  
Docket No. 50-382  
License No. NPF-38  
Reporting of Special Report

Gentlemen:

Attached is Special Report Number SR-92-003-00 for Waterford Steam Electric Station Unit 3. This Special Report is submitted per Technical Specifications 4.8.1.1.3 and 6.9.2 and Regulatory Guide 1.108.

Very truly yours,

D.F. Packer  
General Manager - Plant Operations

DFP/CJT/ssf  
Attachment  
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## SPECIAL REPORT

SR-92-003

### REPORTABLE OCCURRENCE

On December 7, 1992, at 1304 hours, Emergency Diesel Generator (EDG) 'A' was started per Operating Procedure OP-903-068 to demonstrate the operability of the diesel in accordance with Technical Specification (TS) 4.8.1.1.2. The EDG started in 11.7 seconds. The TS requires that the EDG reach rated speed and voltage in less than or equal to 10 seconds. This event is classified as a valid failure in accordance with Regulatory Guide 1.108 and is reported in accordance with TS 4.8.1.1.3. This failure is the third failure in the last 100 valid tests.

### INITIAL CONDITIONS

Plant Power: 100%

Mode: 1

Procedures Being Performed Specific to this Event:

OP-903-068, "Emergency Diesel Generator And Subgroup  
Relay Operability Verification"

OP-903-115, "Train A Integrated Emergency Diesel  
Generator/Engineering Safety Features Test"

Technical Specification LCO's in Effect Specific to this Event: None

Major Equipment Out of Service Specific to this Event: None

### EVENT DESCRIPTION

On December 7, 1992, while performing the EDG 'A' monthly surveillance per OP-903-068, the EDG failed to start in less than or equal to 10 seconds. The EDG was declared inoperable at 1304 hours and troubleshooting was initiated to determine the cause. The turning gear interlock valves' control brackets were not properly positioned to depress the valves' plungers 1/8" as recommended by the Cooper-Bessemer vendor manual. This condition prohibited control air from passing through the right bank interlock valve and restricted flow through the left bank interlock valve.

Unrestricted flow through at least one interlock valve is required to achieve the less than or equal to 10 second start requirement.

#### EVENT CHRONOLOGY

(dates and approximate times of occurrences)

October 28, 1992

- 1613 Installed new turning gear interlock valves EGA-303A and EGA-304A per Work Authorization (WA) 01101900. OP-903-115 Diesel 'A' Lockout Test is satisfactorily performed to verify operability.

November 10, 1992

- 1330 EDG 'A' is manually started per OP-903-068. The EDG starts in 5.8 seconds and carries load for 61 minutes.

November 19, 1992

- 1800 Installed new control air regulator, EGA-408A, per WA 01102906.
- 2041 OP-903-068 timed start is performed to verify operability. The EDG starts in 9.75 seconds. The start evaluation data sheet and an operator note of the slow start is forwarded to the operations clerk for transmittal to the System Engineer for evaluation.

December 7, 1992

- 1304 During Engineered Safety Feature Actuation Signal (ESFAS) Module Start per OP-009-002, EDG 'A' starts in 11.7 seconds. The EDG is declared inoperable. The System Engineer is notified immediately.
- 1358 A troubleshoot ESFAS Test Module Start is performed to assess the cause of the late start. The EDG starts in 10.36 seconds.

- 1422 A second troubleshoot ESFAS Test Module Start is performed. The EDG starts in 10.22 seconds. It is observed that no air is leaving the right bank air receiver. WA 01103555 is generated to determine the cause of the problem.
- 1500 While troubleshooting, it was determined that the turning gear interlock valves' control brackets (one per valve) were not fully depressing the valves' plungers. WA 01103555 was returned to maintenance planners for additional instructions.
- 1755 The control brackets for the turning gear interlock valves are adjusted per WA 01103555. OP-903-115 Diesel 'A' Lockout Test is performed. An ESFAS Test Module Start is performed per OP-009-002. The EDG starts in 6.05 seconds.
- 2003 EDG 'A' is declared operable.

#### CAUSAL FACTORS

Entergy Operations, Inc. believes that the root cause of this event was the failure to properly secure the turning gear brackets that make contact with the turning gear interlock valve plungers. Each bracket was secured to the turning gear frame with two 5/16" bolts and washers. The washers were found to be inappropriate in that their outer diameters are smaller than standard washers. This condition can result in poor surface area contact between the washers and the bracket and facilitate slippage. The inappropriate washers were only found on EDG 'A'. The washers on EDG 'B' were verified to be standard size. Furthermore, there is no vendor recommended torque requirement for the 5/16" bolts. Consequently, the bolts were not torqued.

Thus, it appears that engine vibration caused the turning gear bracket to slide during the successful start and load run on November 10, 1992. These brackets must be positioned such that they depress the plungers of

the turning gear valves 1/8" with the turning gear fully disengaged. With the plungers in this position, control air passes through the interlock valves and supplies the air start solenoid valves with control air. Upon initiation of a start signal, the starting air solenoid valves open and allow control air to open the air start valve which supplies starting air to the diesel.

Additionally, a causal factor and a non-causal factor were identified. The causal factor is that the inappropriate washers appeared to be those originally supplied with the diesel. The non-causal factor is that no actions were taken to address the 9.75 second start on November 19, 1992.

#### CORRECTIVE MEASURES

The control brackets for the turning gear interlock valves were adjusted to assure that they depress the turning gear interlock valve plungers one-eighth inch. EDG 'A' was successfully started in 6.05 seconds. Condition Identifications (CIs) were initiated to assure that the turning gear interlock valve bracket bolts are properly torqued and that the bolts are fitted with the proper size washers.

The Cooper-Bessemer drawing, KSV-55-2, will be revised to provide torque values for the turning gear interlock valve bracket bolts. System Engineering will evaluate the method by which the EDG System Engineer is notified of EDG start times. Furthermore, UNT-005-020, "Post Maintenance Testing," will be reviewed and revised as appropriate to provide additional guidance on the post maintenance tests that should be performed following maintenance on EDG starting and control circuits. These actions will be completed by April 30, 1993.

#### SAFETY SIGNIFICANCE

This event is classified as a valid failure since EDG 'A' did not reach rated speed and voltage in less than or equal to 10 seconds as required by the TS. This failure is the third failure in the last 100 valid tests and the current surveillance test interval is at least once per 31 days. An



engineering evaluation of this event determined that the EDG would have performed its safety function and that the health and safety of the public and plant personnel were not compromised.

#### SIMILAR EVENTS

No previous similar events were identified.