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D. F. Packer
General Manager
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Waterford 3

W3F1-94-0173
A4.05
PR

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 Licensee Event Report

Gentlemen:

Attached is Licensee Event Report Number LER-94-012-00 for Waterford Steam Electric Station Unit 3. This Licensee Event Report is submitted in accordance with 10CFR50.73(a)(2)(i) and 10CFR50.36(c)(2).

Very truly yours,

D.F. Packer
General Manager
Plant Operations

DFP/CJT/tjs
Attachment

cc: L.J. Callan, NRC Region IV
G.L. Florreich
J.T. Wheelock - INPO Records Center
R.B. McGehee
N.S. Reynolds
NRC Resident Inspectors Office
Administrator - LRPD

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Waterford Steam Electric Station Unit 3	05000 382	1 OF 9

TITLE (4)
Noncompliance with EDG Surveillance Requirements Due to Inadequate Procedures

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									N/A	05000
09	07	94	94	-- 012 --	00	10	07	94	FACILITY NAME: N/A	DOCKET NUMBER: 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii) X	50.36(c)(2)	50.73(a)(2)(vii)	OTHER
20.405(a)(1)(iii) X	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
D.C. Matheny, Superintendent, Operations	(504) 464-3178

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On September 7, 1994, Waterford 3 training personnel discovered the failure to perform Technical Specification (TS) Surveillance Requirements 4.8.1.1.2.d.3a and 3b and 4.8.1.1.2.d.5a and 5b for the 4160V Bus 3AB and 480V Bus 31AB load groups. These surveillance requirements demonstrate operability of the Emergency Diesel Generators (EDGs) by ensuring that during a loss-of-offsite power by itself, or in conjunction with a safety injection actuation test signal, the emergency buses will deenergize, load shed, and properly reload. By 1316 hours that same day, EDG B had been declared inoperable and TS Action 3.8.1.1.b entered. Buses 3AB and 31AB were aligned to the B-train at that time. The most probable root cause of this event is an inadequate procedure. Corrective actions include tests of loads from Buses 3AB and 31AB, reviews of selected surveillance procedures and appropriate procedure revisions. TS Bases for 3/4.8.1 will be revised to clarify what is meant by permanently connected loads. The missed surveillance requirements will be fully implemented prior to startup following Refuel 7. This event did not compromise the health and safety of the public.

REQUIRED NUMBER OF DIGITS/CHARACTERS
FOR EACH BLOCK

BLOCK NUMBER	NUMBER OF DIGITS/CHARACTERS	TITLE
1	UP TO 46	FACILITY NAME
2	8 TOTAL 3 IN ADDITION TO 05000	DOCKET NUMBER
3	VARIES	PAGE NUMBER
4	UP TO 76	TITLE
5	6 TOTAL 2 PER BLOCK	EVENT DATE
6	7 TOTAL 2 FOR YEAR 3 FOR SEQUENTIAL NUMBER 2 FOR REVISION NUMBER	LER NUMBER
7	6 TOTAL 2 PER BLOCK	REPORT DATE
8	UP TO 18 -- FACILITY NAME 8 TOTAL -- DOCKET NUMBER 3 IN ADDITION TO 05000	OTHER FACILITIES INVOLVED
9	1	OPERATING MODE
10	3	POWER LEVEL
11	1 CHECK BOX THAT APPLIES	REQUIREMENTS OF 10 CFR
12	UP TO 50 FOR NAME 14 FOR TELEPHONE	LICENSEE CONTACT
13	CAUSE VARIES 2 FOR SYSTEM 4 FOR COMPONENT 4 FOR MANUFACTURER NPRDS VARIES	EACH COMPONENT FAILURE
14	1 CHECK BOX THAT APPLIES	SUPPLEMENTAL REPORT EXPECTED
15	6 TOTAL 2 PER BLOCK	EXPECTED SUBMISSION DATE

REPORTABLE OCCURRENCE

This event constitutes a failure to meet the operability requirements of Technical Specification (TS) 3.8.1 and the action requirements TS 3.8.1.1. This event is reportable as an operation prohibited by Technical Specifications pursuant to 10CFR50.73(a)(2)(i)(B) and 10CFR50.36(c)(2).

INITIAL CONDITIONS

At the time this condition was identified, Waterford 3 was operating at approximately 100 percent power in Operational Mode 1 (Power Operation). Bus 3AB, which can receive power from either Bus 3A or 3B, but not from both simultaneously, was aligned to receive power from Bus 3B. Both Emergency Diesel Generators (EDG; EIIS Identifier EK) were operable.

EVENT DESCRIPTION

In anticipation of receiving an Operating License, Waterford 3 began developing surveillance and preoperational test procedures. As part of that effort, OP-903-069 (Revision 0), "Emergency Diesel Post Inspection Operability Check," received final approval on August 4, 1982. The procedure provided instructions for demonstrating EDG operability per Standard TS surveillance requirements 4.8.1.1.2.d.2 through 4.8.1.1.2.d.11. However, the procedure was deficient in that it did not subject Buses 3AB (EIIS Identifier EB-BU) and 31AB (EIIS Identifier EC-BU) to the Integrated Emergency Diesel Generator/Engineering Safety Features tests required by the Technical Specifications.

Startup Integrated Test Procedure SIT-TP-200, "Integrated Engineered Safety Features," was also developed during that time. The main purpose of SIT-TP-200 was to demonstrate the proper operation of all the necessary equipment (including the diesel generators) required during a Loss of Coolant Accident (LOCA), main generator trip, loss of offsite power and ESF actuation test signal in conjunction with loss of offsite power. Additionally, the test demonstrated load group assignments, operation of AB

equipment, operational sequencing of ESFAS, that accident loads did not exceed EDG rating, EDG load rejection capability, loading sequence and EDG regulation, and that sufficient equipment was available to perform a safe shutdown.

SIT-TP-200 was performed during December 1983 through February 1984. The test demonstrated EDG operability by performing integrated tests of the 4160V Bus 3AB and the 480V Bus 31AB load groups.

Subsequent to the completion of preoperational testing, fuel loading and low power testing, Waterford 3 was issued Facility Operating License No. NPF-38 on March 16, 1984. Revision 1 to Surveillance Procedure OP-903-069, "Emergency Diesel Post Inspection Operability Check," received final approval on March 20, 1984. Like its predecessor, Revision 1 did not subject Buses 3AB and 31AB to the Integrated Emergency Diesel Generator/Engineering Safety Features Test. For example, when testing Bus 3A, Bus 3AB was required to be aligned to Bus 3B. Similarly, when testing Bus 3B, Bus 3AB was required to be aligned to Bus 3A.

Although Revision 1 to OP-903-069 remained deficient, it appears that an earlier draft to Revision 1 may have included provisions for testing Bus 3AB. During the review and approval process, a reviewer noted that High Pressure Safety Injection (HPSI) Pump AB (EIIS Identifier BQ-P), Component Cooling Water (CCW) Pump AB (EIIS Identifier CC-P) and Chiller AB (EIIS Identifier KM-CHU) could not operate in conjunction with HPSI Pump A, CCW Pump A, and Chiller A. In response to that comment, the originator deleted all AB equipment from the test. That response was accepted by the reviewer. It is not known whether or not the author intended to incorporate the AB tests into another procedure.

In 1990, Waterford 3 performed a Safety System Functional Inspection (SSFI) of the EDG System. This inspection assessed the capability of the emergency electrical power system (as designed, installed and configured) to perform its intended safety function. No failures to appropriately implement TS surveillance requirements for Buses 3AB and 31AB were identified.

On March 4, 1991, the NRC issued Information Notice (IN) 91-13, "Inadequate Testing of Emergency Diesel Generators (EDGs)." IN 91-13 was issued to alert nuclear power plants to recently discovered inadequacies in the testing of EDGs. Specifically, the notice describes events where some EDG testing has not adequately demonstrated the capability of the EDG to carry its maximum expected loads or to verify the operation of the load shedding logic for the EDG. Waterford 3's review of IN 91-13 resulted in a TS change request to modify TS 4.8.1.1.2.d.2 to increase the EDG voltage limit during load rejection from 4784V to 5023V. Additionally, the review recommended revisions to test procedures to accommodate that change.

Revision 7 and all prior revisions to OP-903-069 did not implement any significant changes -- the procedure remained deficient with respect to tests of Buses 3AB and 31AB. In April 1991, Revision 7 to OP-903-069 was replaced by OP-903-115 (Revision 0), "Train A Integrated Emergency Diesel Generator/Engineering Safety Features Test," and OP-903-116 (Revision 0) "Train B Integrated Emergency Diesel Generator/Engineering Safety Features Test." OP-903-115 and OP-903-116 received final approval on April 3, 1991, and April 20, 1991, respectively. New Procedure Request Forms indicate that the Integrated Emergency Diesel Generator/Engineering Safety Features Test was separated into an A-train test and a B-train test to allow quicker closure and transmittal of completed test documentation. Also, the change allowed each test to be formatted in accordance with a newly issued Writer's Guide.

On May 6, 1992, during a review and walkdown of the emergency diesel generator system, Waterford 3 was informed that procedures OP-903-115 and OP-903-116 did not fully verify that the "turning gear engaged" lockout feature prevented the EDG from starting as required by TS surveillance requirement 4.8.1.1.2.d.12a. Additionally, this condition was identified as a violation of NRC requirements (NOV 9208-02). In response, Waterford 3 submitted LER 92-004 and committed to appropriately revise OP-903-115 and OP-903-116. On the basis of comprehensive reviews and no previously identified surveillance deficiencies, there was high confidence that TS surveillance requirements were fully implemented. The surveillance requirement was incorporated into OP-903-115 and OP-903-116 on September 12, 1992.

In February 1993, Waterford 3 began implementing the Corrective Action improvement program with full management support. By May 31, 1994, new corrective action procedures and site wide training had been implemented. Additionally, a new single corrective action document, the Condition Report (CR), was created that lowered and better defined implementing thresholds and perceived barriers to condition identification.

On September 7, 1994, a Reactor Operator attending Senior Reactor Operator (SRO) training class questioned why Surveillance Procedure OP-903-001, "Technical Specification Logs," requires daily verification that the undervoltage coils (EIIS Identifier EB/EC-27-CL) on the AB buses are operating satisfactorily. In response to that question, an SRO Senior Instructor commenced a review of applicable Technical Specifications and Surveillance Procedures.

The SRO Senior instructor could have stated that the 3 out of 3 logic associated with the undervoltage relays offers more chances of failure to react to a bonafide loss of voltage. In order to test and ensure the readiness for operation of undervoltage relays 27-1, 27-2 and 27-3, one selector switch for each ESF bus has been provided in the main control room which simulates a loss of voltage by interrupting each relay AC circuit, one at a time. This relay test is performed once a day per OP-903-001 and is annunciated in the control room. Instead of providing that answer, however, the SRO Senior instructor reviewed Technical Specifications 3.3.2 and 3/4.8.1 and discovered that Surveillance Procedures OP-903-115 and OP-903-116 may not adequately satisfy TS Surveillance Requirements for the EDGs.

The instructor immediately notified his supervisor (an individual who has filled the SRO position on-shift for many years). The supervisor informed the Control Room of the condition and directed the instructor to initiate a CR. After initiating the CR, the instructor immediately hand carried the CR to the Control Room. By 1316 hours that same day, the condition had been confirmed, EDG B was declared inoperable (the Bus AB was aligned to the B side at that time) and TS Action 3.8.1.1.b was entered.

CAUSAL FACTORS

A Root Cause Analysis Team formed to investigate this condition identified three factors that may have influenced the performance of individuals involved with this event:

1. Misunderstanding of TS Surveillance Requirements. TS Surveillance Requirements 4.8.1.1.2.d.3b and 4.8.1.1.2.d.5b require (while simulating a loss of offsite power by itself and a loss of offsite power in conjunction with an SIAS actuation test signal) verification that the diesel will energize the emergency buses with permanently connected loads and the auto-connected emergency loads through the load sequencer. It has been suggested that these surveillance requirements exclude the 4160V Bus 3AB and 480V Bus 31AB load groups. That belief may be based on the interpretation that Bus 3AB is not a "permanently connected load." The third-of-a-kind equipment on Bus 3AB may be utilized by connecting Bus 3AB to Bus 3A or 3B. The reassignment of loads on Bus 3AB requires a "dead bus" transfer. It is therefore not a normal practice to transfer Bus 3AB because the momentary deenergization of the bus results in a temporary loss of various auxiliary components.

2. Inadequate Technical Reviews. The development or major revision to a procedure that implements multiple TS surveillance requirements should receive concurrent input from various subject matter experts. During the initial development of OP-903-069 in 1982, some individuals may have lacked the appropriate knowledge and training to detect this problem. That presumption may explain why Buses 3AB and 31AB were not included in the Integrated Emergency Diesel Generator/Engineering Safety Features Test. However, it is not clear why the originator "deleted AB equipment" from the test in response to a reviewer's comment. It should be noted that, due to insufficient information, the team could only speculate about conditions surrounding the development of OP-903-069.

3. Potential Opportunities to Identify. While 3AB testing is not specifically mentioned in the following documents, a critical review reveals that potential opportunities to identify this condition may have existed prior to September 7, 1994: the 1990 SSFI of the EDG System; reviews associated with IN 91-13; and the implementation of OP-903-115 and OP-903-116. After reviewing the depth, scope and purpose of these potential opportunities, it can be concluded that no corrective actions related to these reviews are necessary.

Given the above, the team determined that the most probable root cause of this event is an inadequate procedure apparently due to one or more of the following conditions. First, there may have been a possible misunderstanding of the concept of permanently connected loads as described in TS 4.8.1. Second, the originator of Revision 1 to OP-903-069 acted inappropriately by deleting the AB equipment from an earlier draft and the technical reviews for that procedure were inadequate in that they did not detect the problem.

CORRECTIVE MEASURES

Immediately following the identification of this event, a CR was generated and EDG B declared inoperable. A Standing Order was issued that prohibits the alignment of any third-of-a-kind AB components.

On September 8, 1994, the feeder breaker supplying the backup power supply to the Plant Monitoring Computer (PMC) Static Uninterruptible Power Supplies (SUPS; EIIS Identifier EF) was tagged in the open position. On September 9, 1994, Waterford 3 asked the NRC to exercise enforcement discretion not to enforce compliance with TS 4.8.1.1.2.d surveillance requirements for 7 days. The discretion was needed to allow approval of an emergency TS change permitting continued operation. As justification, Waterford 3 utilized previous surveillance testing, operational events, and load analyses. The NRC issued enforcement discretion at 1632 hours. Subsequently, Waterford 3 declared EDG B operable.

On September 22 and 25, 1994, and October 6, 1994, tests of CCW Pump AB, Chiller AB, HPSI Pump AB and Charging Pump AB (EIIS Identifier CB-P) were conducted. The tests subjected these components to loss of voltage (LOV) and LOV in conjunction with SIAS (or simulation of these signals) that would be present in the integrated test required by the Technical Specifications for EDG B (Bus AB is currently aligned to the B side). Additionally, the PMC SUPS alternate power supply was tested for shedding. The tests demonstrated that these components performed satisfactorily per TS surveillance requirements.

ACTIONS TO PREVENT RECURRENCE

Five corrective actions to prevent recurrence were identified:

1. TS 3/4.8.1 will be reviewed to verify all surveillance requirements are appropriately implemented.

2. OP-903-115 and OP-903-116 will be revised to appropriately implement TS Surveillance Requirements.

3. The Integrated Emergency Diesel Generator/Engineered Safety Features tests required by the Technical Specifications will be implemented prior to startup following Refuel 7.

4. TS Bases for 3/4.8.1 will be revised to clarify what is meant by "permanently connected loads."

5. Selected surveillance procedures will be reviewed to assure that TS surveillance requirements are fully implemented. Based on the results of that review additional actions will be taken as appropriate.

SAFETY SIGNIFICANCE

In the Request for Enforcement Discretion, Waterford 3 utilized previous surveillance testing, operational events, and load analyses to demonstrate that shedding of the nonessential AB loads and energization of the AB emergency buses and respective loads by the aligned EDG would probably have occurred if required. The tests conducted on September 22 and 25, 1994, and October 6, 1994, demonstrated that CCW Pump AB, Chiller AB, HPSI Pump AB and Charging Pump AB automatically shed and reloaded as designed and that the PMC SUPS alternate power supply shed as designed. These tests demonstrate that the aligned diesel would have performed its safety function if required. Additionally, performance of the Integrated Emergency Diesel Generator/Engineering Safety Features Tests has demonstrated that the EDG not aligned to the AB Buses would have performed its safety function. Therefore, this condition did not compromise the health and safety of the public or plant personnel.

SIMILAR EVENTS

A review of LERs dating back to 1992 revealed three LERs that document failures to perform TS required surveillances due to surveillance procedures not fully implementing TS surveillance requirements: LERs 92-004, 94-003 and 94-005. LER 92-004 is the only LER in that group that documents a failure to implement TS 4.8.1 surveillance requirements.