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W3F1-94-0226
A4.05
PR

December 21, 1994

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-94-017-00 for Waterford Steam Electric Station Unit 3. This Licensee Event Report is submitted in accordance with 10CFR50.36(c)(2) and 10CFR50.73(a)(2)(i).

Very truly yours,

R.S. Starkey
Acting General Manager
Plant Operations

RSS/RTK/tjs
Attachment

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

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)
Load Rejection Testing Requirements for Emergency Diesel Generators Not Met

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
11	22	94	94	-- 017 --	00	12	21	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, Operations Superintendent	(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)

	YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On November 22, 1994, Waterford 3 personnel discovered that the Technical Specification (TS) Surveillance Requirements of 4.8.1.1.2.d.1 had not been satisfied during previous refuel outage testing. These surveillance requirements demonstrate operability of the Emergency Diesel Generators (EDGs) by assuring the EDGs have the capability to reject the largest single emergency load without exceeding the specified output voltage and frequency constraints. Testing was performed during past refuel outages utilizing a load of approximately 230 Kilowatts (KW). The TS requires the rejected load to be at least 498 KW. The most probable root cause of this event is an inadequate procedure. The immediate corrective actions included the successful surveillance testing of the EDGs during the TS allowed 24 hour time interval. An alternate testing method will be investigated and TS 3/4.8.1 will be reviewed and revised as necessary. The discovery of this event was the result of a corrective action follow-up from LER-94-012-00. 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

REQUIRED NUMBER OF DIGITS/CHARACTERS FOR EACH BLOCK

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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 Specifications (TS) 3.8.1 "Electrical Power Systems; A.C. Sources" and the action requirements of 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). No procedures specific to this event were being performed at the time of this event. There was no major equipment out of service specific to this event and no Technical Specification Limiting Conditions for Operation (LCO's) were in effect specific to this event at the time the condition was discovered.

EVENT DESCRIPTION

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(3b) and 4.8.1.1.2.d.5a(5b) for the 4160V Bus 3AB (EIIS Identifier EB-BU) and 480V Bus 31AB (EIIS Identifier EC-BU) load groups. These surveillance requirements demonstrate operability of the Emergency Diesel Generators (EDG; EIIS Identifier EK) by ensuring that during a Loss-of-Offsite Power (LOOP) by itself, or in conjunction with a Safety Injection Actuation Signal (SIAS), the emergency buses will de-energize, load shed, and properly reload. As a result of this event, a Licensee Event Report (LER-94-012-00) was submitted. As one of the actions to prevent recurrence of this event, LER-94-012-00 states that the Technical Specification 3/4.8.1 "Electrical Power Systems; AC Sources" will be reviewed to verify all surveillance requirements are appropriately implemented. The Shift Technical Advisors were tasked with performing this review.

While performing this review, the Shift Technical Advisor Group identified a possible noncompliance with the requirements of TS 4.8.1.1.2.d.1 based on the tests conducted during the Refuel 6 Outage. On November 22, 1994, at 0930 hours a meeting was held to discuss this TS. Technical Specification 4.8.1.1.2.d.1 states that "Each diesel generator shall be demonstrated OPERABLE at least once per 18 months during shutdown by verifying the generator capability to reject a load of greater than or equal to 498 KW (HPSI pump) while maintaining voltage at 4160 +420, -240 volts and frequency at 60 +4.5, -1.2 hertz".

The testing conducted during past refuel outages to meet the requirements of the TS utilized a High Pressure Safety Injection pump (HPSI pump; EIIS Identifier BQ-P) operating on minimum flow recirculation for the rejected load. However, a HPSI pump does not provide a load greater than or equal to 498 KW when operating in minimum flow recirculation mode. This is based on Final Safety Analysis Report (FSAR) Table 8.3-1 which rates a running HPSI pump at 371.5 KW under a Loss of Coolant Accident (LOCA) or a Main Steam Line Break (MSLB) condition.

On November 22 at 1000 hours, Waterford 3 entered Site Directive W4.101 "Operability/Qualification Confirmation Process" and Technical Specification 4.0.3. The site directive provides instructions and guidelines to address situations where the qualification status of installed quality related components or equipment cannot be unequivocally demonstrated or where a degraded or nonconforming condition results in a judgment that the equipment is operable, but there are some remaining concerns or uncertainties. Entry into this directive occurs when the Shift Supervisor determines engineering support may be necessary to confirm the current operability or qualification of plant equipment per Waterford 3 Administrative Procedure UNT-006-011 "Condition Report". Technical Specification 4.0.3 provides a 24 hour allowance to permit a delay in implementing ACTION requirements when complete surveillance requirements have not been performed.

An investigation by Waterford 3 personnel revealed that the surveillance requirements of TS 4.8.1.1.2.d.1 could be satisfied by the performance of a modified existing operating procedure. Operating procedure OP-009-002 "Emergency Diesel Generator" Revision 13 Change A Deviation was subsequently prepared, reviewed, and approved by Waterford 3 personnel. The deviation from the original procedure added steps to energize, start, stop, and de-energize chart recorders. In addition, a change was made to the diesel generator loading prior to opening the output breaker to secure the diesel.

At 2032 hours on November 22, 1994, EDG A was started in order to perform Surveillance Procedure OP-903-068 "Emergency Diesel Generator and Subgroup Relay Operability Verification" and OP-009-002 "Emergency Diesel Generator" Revision 13 Change A Deviation. The EDG was loaded to approximately 4.3 MW at 2042 hours and run for one hour. At 2143 hours the EDG was unloaded to 600 KW. The EDG output breaker was opened at 2147 hours and a recorder documented the voltage and frequency. The voltage fluctuated from 4200 volts up to 4235 volts maximum and down to 4060 volts minimum. The frequency fluctuated from 60 HZ up to 60.75 HZ maximum and down to 60.125 HZ minimum. All of the above parameter fluctuations were within the TS requirements for rejecting a load greater than or equal to 498 KW while maintaining voltage at 4160 +420, -240 volts and frequency at 60 +4.5, -1.2 hertz. On November 22, 1994, at 2254 hours the EDG A was declared operable and TS 4.0.3 was exited. At this point, Waterford 3 was complying with TS 3.8.1.1 Action Statement 'b' for EDG B. This Action Statement requires in part that with one diesel generator inoperable, this diesel generator shall be restored to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

At 2313 hours on November 22, 1994, EDG B was started in order to perform Surveillance Procedure OP-903-068 "Emergency Diesel Generator and Subgroup Relay Operability Verification" and OP-009-002 "Emergency Diesel Generator" Revision 13 Change A Deviation. The EDG was loaded to approximately 4.3 MW at 2323 hours and run for one hour. On November 23, 1994, at 0024 hours the EDG was unloaded to 600 KW. The EDG output breaker was opened at 0026

hours and a recorder documented the voltage and frequency. The voltage fluctuated from 4200 volts up to 4217 volts maximum and down to 4060 volts minimum. The frequency fluctuated from 60 HZ up to 60.375 HZ maximum and down to 60.25 HZ minimum. All of the above parameter fluctuations were within the TS requirements for rejecting a load greater than or equal to 498 KW while maintaining voltage at 4160 +420, -240 volts and frequency at 60 +4.5, -1.2 hertz. On November 23, 1994, at 0100 hours the EDG B was declared operable. At this time TS 3.8.1.1 and Site Directive W4.101 "Operability/Qualification Confirmation Process" were exited.

CAUSAL FACTORS

The Technical Specification review which led to the discovery of the condition addressed by this LER was initiated as a recommended corrective action for LER-94-012-00. The procedural errors identified were made during the original development of OP-903-069 ``Integrated Emergency Diesel Generator/Engineered Safety Features Test'' in March of 1984.

A Root Cause Analysis Team formed to investigate the condition described in this LER identified three factors that may have influenced the performance of individuals involved with this event. First, there was an apparent misunderstanding of the TS surveillance requirements. TS surveillance requirement 4.8.1.1.2.d.1 requires verification that the diesel will reject a load of greater than or equal to 498 KW (HPSI pump) while maintaining voltage at 4160 +420, -240 volts and frequency at 60 +4.5, -1.2 hertz. It appears that plant personnel assumed that a load rejection of a HPSI pump automatically resulted in a loss of at least 498 KW from the EDG.

Secondly, 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 "Integrated Emergency Diesel Generator/Engineered Safety Features Test", which is the predecessor to OP-903-115 and OP-903-116, some individuals may have lacked the appropriate knowledge and training to detect this problem. That presumption may explain why the load rejection specified was not quantitatively verified. However, it is not clear why

the originator revised the load rejection procedure per Revision 1 in March of 1984. It should be noted that due to insufficient information, the team could only speculate about conditions surrounding the development of OP-903-069.

Lastly, a critical review conducted previously for LER-94-012-00 revealed several opportunities to identify EDG TS surveillance inadequacies. After reviewing the depth, scope and purpose of these potential opportunities, it was concluded that no corrective actions related to these reviews were necessary. It has been determined after a review of most of these same documents with respect to the load rejection issue that this conclusion still applies.

Given the above, 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 misunderstanding of the "498 KW (HPSI pump)" load defined in TS 4.8.1.1.2.d.1. Second, the originator of Revision 1 to OP-903-069 acted inappropriately by not requiring verification of the actual KW load rejected during the test. Furthermore, the technical reviews for that procedure were inadequate in that these reviews did not detect the problem. These conclusions are consistent with and further validate the root cause identified in LER-94-012-00.

IMMEDIATE CORRECTIVE MEASURES

Immediately following the identification of this event, a Condition Report (CR-94-1108) was generated in accordance with Waterford 3 Administrative Procedure UNT-006-011 "Condition Report" to provide a means to implement the Waterford 3 Corrective Action improvement program. Waterford 3 also entered Site Directive W4.101 "Operability/Qualification Confirmation Process" and Technical Specification 4.0.3. A Standing Instruction was issued to the control room staff listing the following compensatory actions. First, Operations personnel were instructed to perform Surveillance Procedure OP-903-066 "Electrical Breaker Alignment Check" every eight hours. This procedure provides instructions to check Offsite Power to Class 1E Distribution Trains when one or two Emergency Diesel

Generators are out of service. Secondly, the control room personnel were instructed not to voluntarily remove equipment from service that would result in entry into any TS Actions. A third instruction to the control room staff specified that any risks or perturbations to the plant were to be minimized.

ACTIONS TO PREVENT RECURRENCE

Six corrective actions to prevent recurrence were identified:

1. Design documents will be reviewed to verify the largest single load on the 4160 volt safety buses. The corresponding KW rating for this load will be determined.

2. An alternate method of rejecting a 498 KW load or greater will be investigated.

3. Technical Specification 4.8.1.1.2.d.1 will be reviewed to determine whether a revision is required to clarify the magnitude and identification of the load rejection specified.

4. The bases for TS 3/4.8.1 will be revised to better define the source and intent of the "498 KW (HPSI pump)" requirement.

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

6. The revised Integrated Emergency Diesel Generator/Engineering Safety Features tests (OP-903-115, OP-903-116) required by the TS will be implemented prior to startup following Refuel 7.

Also, the corrective action in LER-94-012-00 which states that "Selected surveillance procedures will be reviewed to assure that TS surveillance requirements are fully implemented" will continue to be pursued.

SAFETY SIGNIFICANCE

The diesel generator surveillance testing performed once every 18 months during shutdown is based on the specifications of Regulatory Guide 1.108, Regulatory Position C.2. Regulatory Guide 1.108 Position C.2.a.4 states that testing of diesel generator units during the plant preoperational test program and at least once every 18 months should demonstrate proper operation during diesel generator load shedding. This should include a test of the loss of the largest single load and of complete loss of load. While performing the test, a verification that the voltage requirements have been met and the overspeed limits are not exceeded is also specified.

Waterford 3 Technical Specification 4.8.1.1.2.d.1 states that "Each diesel generator shall be demonstrated OPERABLE at least once per 18 months during shutdown by verifying the generator capability to reject a load of greater than or equal to 498 KW (HPSI pump) while maintaining voltage at 4160 +420, -240 volts and frequency at 60 +4.5, -1.2 HZ". The tests performed during the past refuel outages intending to fulfill these surveillance requirements utilized a HPSI pump operating in minimum flow recirculation mode as the rejected load. It has been determined that this represented a load rejection of approximately 230 KW based on field current and voltage readings.

The testing conducted on November 22 and 23, 1994, demonstrated that the Emergency Diesel Generators were capable of rejecting a load of greater than or equal to 498 KW without tripping while remaining within the TS allowed voltage and frequency constraints. These tests verified that the Emergency Diesel Generators were functioning as designed and would have performed the safety functions if required.

After an analysis of the startup testing data, the Refuel 6 testing data, and the data obtained during the testing performed on November 22 and 23, 1994, for the Emergency Diesel Generators, Waterford 3 believes the Emergency Diesel Generators were always capable of performing the required safety functions. On the basis of the information above, this event did not compromise the health and safety of the public.

SIMILAR EVENTS

A review of LERs dating back to 1992 revealed four LERs (LER-92-004, LER-94-003, LER-94-005, and LER-94-012) that document failures to perform TS required surveillances due to surveillance procedures not fully implementing TS surveillance requirements. Two of these LERs (LER-92-004, LER-94-012) document failures to implement TS 4.8.1 surveillance requirements. The event described in this LER was discovered while performing an Action to Prevent Recurrence for LER-94-012.