Entergy Operations

Entergy Operations, Inc.
P.O. Box R
Killona, LA 70066
Tel 504-739-6660

Ref. 10CFR50.73(a)(2)(i)

W3B5-91-0099
A4.05
QA

May 17, 1991

U.S. Nuclear Regulatory Commission
ATTENTION: 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-90-010-01 for Waterford Steam Electric Station Unit 3. This Licensee Event Report supplement is submitted to update the status of the IST plan revision and the safety valve test supervisor relief request. This Licensee Event Report is submitted pursuant to 10CFR50.73(a)(2)(i).

Very truly yours,

J.R. McGaha
General Manager - Plant Operations

JRM/DDW/rk
Attachment

cc: Messrs. R.D. Martin
G.L. Florreich
J.T. Wheelock - INPO Records Center
E.L. Blake
D.L. Wigginton
N.S. Reynolds
NRC Resident Inspectors Office

21-94

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NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Waterford Steam Electric Station Unit 3	0 5 0 0 0 3 8 2	1 OF 0 6

TITLE (4)

Inconsistencies in the Pump and Valve In-Service Test Program

EVENT DATE (5)			LER NUMBER (6)					REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR		SEQUENTIAL NUMBER		REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
											N/A	0 5 0 0 0
0 7	0 9	9 0	9 0	—	0 1 0	—	0 1	0 5	1 7	9 1	N/A	0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	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)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		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
G.M. Davis, Event Analysis, Reporting, and Response Manager	AREA CODE 5 0 4 — 4 6 4 - 3 1 1 5

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 fifteen single-space typewritten lines) (16)

On July 9, 1990, plant personnel discovered several inconsistencies in the Pump and Valve In-Service Test (PVIST) program during a program review. Specifically, feedwater system (FW) check valves, FW-181A and B, and both Emergency Diesel Generator (EDG) fuel oil transfer pumps had been excluded from the PVIST program and the qualification of the safety valve test supervisors did not satisfy all requirements of ASME Performance Test Code (PTC) 25.3. Because the PVIST program did not meet these specific requirements of ASME Section XI required by Technical Specification (TS) 4.0.5, the plant operated in a condition prohibited by TSs.

The root cause of this event is an inadequate review of ASME Section XI IST requirements during development of the PVIST program. These problems were identified during a thorough review of the IST plan as corrective action for a previous misinterpretation of ASME Section XI in conjunction with the complete program review pursuant to NRC Generic Letter 89-04. Due to the alternative testing being performed on the components and a detailed engineering evaluation, there is a high level of confidence that the subject components would perform their design safety function if required; therefore, this event did not threaten the health and safety of the general public or plant personnel.

On July 9, 1990, Waterford Steam Electric Station Unit 3 was operating at 100% power when plant personnel discovered several inconsistencies in the Pump and Valve In-Service Test (PVIST) program during a program review. Feedwater (FW) check valves, FW-181A and B, (EIIS Identifier SJ-V) and Emergency Diesel Generator (EDG) fuel oil transfer pumps (EIIS Identifier DC-P) had been excluded from the PVIST program. In addition, the qualification of the safety valve test supervisors did not satisfy all the requirements of ASME Performance Test Code (PTC) 25.3. Since the PVIST program did not meet all requirements of ASME Section XI and Technical Specification (TS) surveillance 4.0.5, the plant operated in a condition prohibited by TS.

FW check valves, FW-181A and B, perform a significant safety function by preventing the diversion of Emergency Feed Water (EFW) (EIIS Identifier BA) flow upon a loss of main feedwater. ASME Section XI requires these valves to be tested closed at cold shutdown intervals. FW-181A and B were omitted from the PVIST program because the original author apparently believed the Main Feedwater Isolation Valve (MFIV) (EIIS Identifier SJ-ISV) would automatically shut on an emergency feedwater actuation signal (EFAS) (EIIS Identifier BA-JE) thereby preventing the diversion of EFW away from the Steam Generator (SG) (EIIS Identifier AB-SG). FW-181A and B had been tested by disassembly and inspection but not at the frequency required by ASME Section XI.

The EDG fuel oil transfer pumps are required to transfer fuel to the EDG feed tanks (EIIS Identifier DC-TK) to facilitate continuous EDG operation and should be tested quarterly. The transfer pumps were omitted from the PVIST program based on Regulatory Guide (RG) 1.26 which provides guidelines for establishing component safety classes. Although RG 1.26 applies only to water systems, it was interpreted to exclude fuel oil systems from ASME Section XI requirements. The EDG fuel oil transfer pumps were tested quarterly by OP-903-032, "Surveillance Procedure Quarterly IST Valve Tests" to ensure the desired flow rates were achieved but this test did not meet all the ASME in-service test requirements for pumps.

ASME PTC 25.3 provides guidance for conducting testing of safety valves. Specific qualification of the safety valve test supervisor is given as: "A person who has obtained a degree in a branch of Engineering from a recognized school of Engineering and in addition, has had at least two-years practical experience in fluid flow measurement may be considered qualified to supervise the test". The PVIST implementing procedures did not include these requirements.

The root cause of this event is an inadequate review of the ASME Section XI IST requirements during development of the PVIST program. These problems were identified during a thorough review of the IST plan as part of the corrective action for a previous misinterpretation of ASME Section XI reported in LER 89-014 in conjunction with the complete program review pursuant to NRC Generic Letter (GL) 89-04. No other major discrepancies were identified during this complete plan review. A revision to the IST plan is being submitted to include FW-181A and B and the EDG fuel oil transfer pumps with interim testing scheduled to be completed during the current outage (March through May 1991). This revision is expected to be submitted by September 1, 1991.

Due to system configuration, relief will be requested from three ASME Section XI testing requirements regarding the fuel oil transfer pumps. One requirement is that, "each pump is required to be run at least 5 minutes under conditions as stable as the system permits." The fuel oil is pumped from the storage tank to the feed tank. Due to the size of the feed tank, and the capacity of the fuel oil transfer pump, running the pump for 5 minutes is not possible since the feed tank will be filled before data is recorded. A second requirement,"... resistance of the system shall be varied until either the measured differential pressure or the measured flow equals the corresponding reference value. The test quantities ... shall then be measured," also cannot be met. The method for determining the flow rate of the pump is to use the change in Feed Tank level while pumping from the Fuel Oil Storage Tank to the Feed Tank. Since there is no direct indication of flow rate, flow rate adjustment to a reference value is extremely difficult. Due to the rise in feed Tank level during the test, a constant pump differential pressure also is not achievable. Lastly, lube oil transfer pump bearing vibration measurements are required to be taken with the pump running at baseline conditions. With no flow instrumentation and with the described constant differential pressure method not achievable, this test requirement cannot be met.

A relief request from the requirements of ASME PTC 25.3 for the safety valve test supervisor will be submitted. The test supervisor is required to have a formal education in thermodynamics and fluid mechanics. Additionally, the test supervisor shall have at least two years practical experience in fluid flow measurement and have had experience in test supervision. No fluid flow measurement is required by ASME Section XI. Experience in fluid flow measurement is not applicable to the safety or relief valve testing required by ASME Section XI. Designating a test supervisor with at least two years practical experience in fluid flow measurement would be a hardship with no compensating increase in the level of quality or safety.

With the exceptions of the safety valve test supervisor qualifications and the three fuel oil transfer pump testing requirements, interim testing will meet code requirements.

Based on the findings of a detailed engineering evaluation, there is a high level of confidence that the subject components would perform their design safety function if required. Specifically regarding the check valves, the evaluation referenced Nuclear Regulatory Commission (NRC) Generic Letter 89-04, which allows disassembly and inspection as an alternative test in cases where stroke testing is impractical. Generic Letter 89-04 also states that other predictive maintenance tests may be qualified as acceptable test alternatives. Both disassembly/inspections and Checkmate inspections (predictive maintenance) were done on FW-181A and FW-181B. Additionally, a loss of main feedwater occurred on March 29, 1990, requiring actuation of the EFW system to provide feedwater to the steam generators. The acceptable operation of the EFW system during this event demonstrates the operability of FW-181A and FW-181B.

Regarding the EDG fuel oil transfer pumps, the evaluation states that the transfer pump discharge check valves are tested quarterly by verifying that the transfer pumps achieve the required flow. Therefore, this test verifies that the pump can do its safety function. Although this does not meet the predictive goals of ASME Section XI, the operability test goals of Section XI are met.

Since there is a high level of confidence that the subject components would perform their design safety function if required, this event did not threaten the health and safety of the general public or plant personnel.

SIMILAR EVENTS

A similar problem occurred when Auxiliary Component Cooling Water (ACCW) valves (EIIS Identifier BI-V) ACC-116A and ACC-116B were not included in the PVIST program. This event was reported in LER 89-014. The root cause of this event was misinterpretation of the ASME Section XI definition of 'active' valves. Because ACC-116A and ACC-116B were judged to be 'passive' valves in relation to the ASME XI definition, they were never included in the IST program. The additional inconsistencies listed in this report were found during the review of the PVIST program as a part of the corrective action taken for the event described in LER 89-014.

PLANT CONTACT

G.M. Davis, Event Analysis, Reporting and Response Manager, 504/464-3153.