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Robert J. Murillo
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Waterford 3

W3F1-2009-0072

December 11, 2009

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Licensee Event Report 09-004-00
Waterford Steam Electric Station, Unit 3 (Waterford 3)
Docket No. 50-382
License No. NPF-38

Dear Sir or Madam:

Entergy is hereby submitting Licensee Event Report (LER) 09-004-00 for Waterford Steam Electric Station Unit 3. This report provides details for a condition prohibited by Technical Specification. During Reactor Protection System (RPS) maintenance on the Log Power channel, the RCS Flow Low trip channel was not considered inoperable and placed in trip or bypass condition within one hour. The Log Power signal provides automatic removal of the operating bypass, when utilized, for RCS Flow Low.

This report contains no new commitments. Please contact Robert J. Murillo at (504) 739-6715 if you have questions regarding this information.

Sincerely,

RJM/JDW

Attachment: Licensee Event Report 09-004-00

IE22
NRR

(w/Attachment)
cc: Mr. Elmo E. Collins, Jr.
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
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Arlington, TX 76011-4125

NRC Senior Resident Inspector
Waterford Steam Electric Station Unit 3
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	J.L. Hornsby	(W-MSB4-238)
	(w/Attachment)	
bcc:	Waterford 3 Records Center	(W-GSB-100)

Attachment

W3F1-2009-0072

Licensee Event Report 2009-004-00

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(9-2007)

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 8/31/2010

Estimated burden per response to comply with this mandatory information collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Waterford 3 Steam Electric Station	05000382	1 OF 5

4. TITLE

Condition prohibited by Technical Specification with Log Power Channel Inoperable

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									NA	05000
07	05	2009	2009	- 004 -	00	12	11	2009	FACILITY NAME NA	DOCKET NUMBER 05000

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER Voluntary Report Specify in Abstract below or in NRC Form 366A
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Waterford 3 Steam Electric Station (Robert J. Murillo)	(504) 739-6715

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On 10/15/09, Waterford 3 discovered Technical Specification (TS) 3.3.1 requirements of Table 3.3-1, note C, were not met with logarithmic power inoperable. The Reactor Protection System (RPS) trip channel bistable for Reactor Coolant System (RCS) Flow Low was not bypassed or placed in tripped condition within one hour when the associated RPS channel Logarithmic (Log) Power Excore Nuclear Instrumentation (ENI) was rendered INOPERABLE.

This condition is reportable under 10 CFR 50.73(a)(2)(i)(B), resulting from the operation or condition prohibited by Technical Specification which exceeded the Limiting Condition for Operation (LCO) allowed outage time.

The cause was determined to be inadequate interpretation and wording of the TS requirements associated with TS Table 3.3.-1.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford 3 Steam Electric Station	05000382	2009	- 004 -	00	2 OF 5

NARRATIVE

BACKGROUND

The Reactor Protective System (RPS) portion of the Plant Protection System (PPS) [JC] consists of sensors, calculators, logic, and other equipment necessary to monitor selected Nuclear Steam Supply System (NSSS) and containment conditions and to effect reliable and rapid Control Element Assembly (CEA) insertion (reactor trip) if any or a combination of the monitored conditions approach specified safety system settings. The system's functions are to protect the core and Reactor Coolant System (RCS) [AB] pressure boundary for defined anticipated operational occurrences (AOOs) and also to provide assistance in limiting the consequences for certain postulated accidents. Manual reactor trip is also provided.

Some reactor trip signals are provided with operating bypasses that are required to allow reactor startup. The High Logarithmic Power (HLP), High Local Power Density (LPD), Low Departure from Nucleate Boiling Ratio (DNBR), and Low RCS Flow trips are allowed to be bypassed at prescribed Modes or power levels since these trips would otherwise generate an unnecessary trip signal during reactor startup and power increase. The LPD, DNBR, and RCS Flow Low operating bypasses are required to be automatically removed by the respective channel Log Power excore nuclear instrumentation (ENI) [IG] signal at 1E-4% power (increasing) to ensure the channel function is available to trip the reactor.

Technical Specification (TS) 3.3.1 requires a minimum of 3 out of the 4 Log Power trip channels to be OPERABLE when Log Power is below 1E-4% power in Mode 2, and also in Modes 3, 4 and 5 when CEAs are capable of withdrawal. However, the TS does not require the Log Power trip channels to be OPERABLE while in Mode 1 or above 1E-4% power, even though the DNBR, LPD, and RCS Flow Low trip channels with Log Power dependent operating bypasses are required to be OPERABLE in Modes 1 and 2.

TS 3.3.1, Table 3.3-1 note C requires the PPS operating bypasses for LPD, DNBR, and RCS Flow Low be automatically removed when at or above1E-4% power. This automatic function is dependent upon the Log Power output signal and associated 1E-4% power bistables on the same PPS train. When the Log Power ENI is rendered inoperable, TS Table 3.3-1 note C is not met verbatim for LPD, DNBR, and RCS Flow Low on the same train, even though these operating bypasses are manually defeated by key switch, with their keys removed.

With one or two DNBR, LPD and/or RCS Flow trip channels inoperable, TS 3.3.1 Table 3.3-1 ACTIONs require the inoperable channel(s) to be placed in the bypassed or tripped condition within 1 hour.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford 3 Steam Electric Station	05000382	2009	- 004 -	00	3 OF 5

NARRATIVE

EVENT DESCRIPTION

On 8/20/09, the NRC Resident inspector challenged the Waterford 3 application of the TS 3.3.1 associated with the PPS operating bypasses when the Log Power channel (B) was considered inoperable while in Mode 1. At the time, PPS Log Power channel B was considered inoperable; however, DNBR, LPD, and RCS Flow Low were not considered inoperable based on the understanding that PPS Log Power channels were not required in Mode 1 and there was no reliance on Log Power channels for the automatic removal of operating bypasses since these operating bypasses were not being utilized and were secured in the unbypass position with keys removed from the keyswitches. In response, Waterford 3 applied literal TS 3.3.1 Table 3.3-1 note C wording, which required these operating bypasses to be "automatically removed", declared DNBR, LPD, and RCS Flow Low trip channels inoperable, entered TS 3.3.1 ACTION 2, and placed these trip channels in bypass.

Historical applications of TS 3.3.1 were the following:

The channel B PPS Log Power ENI had been declared inoperable 9/1/2008 since the previous reactor startup, due to elevated power indication at very low power levels due to external induced noise while significantly below power levels typical for approaching reactor criticality. Further evaluation resulted in determination that the Log Power channel B had been Operable, but degraded, fully capable of performing the function to automatically remove the operating bypasses of LPD, DNBR, RCS Flow and Log Power PPS channels. The TS 3.3.1 ACTION 2 was exited, and the trip channels were restored.

On 10/15/09, while performing reviews of plant procedures and historical log entries, Waterford 3 plant personnel discovered Technical Specification (TS) 3.3.1 requirements of Table 3.3-1, note C, were not met during past maintenance testing. Specifically, on 7/5/09, during PPS channel C Log Power calibration test, DNBR and LPD trip channels on the associated channel being tested (C) were bypassed, however, the RCS Flow Low trip channel was not placed in bypass or in tripped condition, or otherwise declared inoperable.

On 11/28/07, during the channel (C) calibration test while D channel ENI Log Power was concurrently inoperable, DNBR and LPD trip channels on the associated channel being tested (C) were bypassed. LPD and DNBR was placed in the tripped condition on the associated channel already inoperable (D). However, RCS Flow Low trip channels were not placed in bypass or in tripped condition, or otherwise declared inoperable on either train (C or D). The Operations procedure for Plant Protection System provides requirements for testing Excore/CPC channel while another channel is already inoperable; however, this procedure does not address the RCS Flow Low trip channel.

Compliance was not met for TS 3.3.1 Table 3.3-1 Action 2, Action 3, nor TS 3.0.3.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford 3 Steam Electric Station	05000382	2009	- 004 -	00	4 OF 5

NARRATIVE

CAUSAL FACTORS

NRC issuance of Amendment No. 40 (ADAMS Accession No. ML021760266) changed the Technical Specifications by removing the operability and surveillance requirements for Log Power Channels when reactor power is above 1E-4% of rated thermal power. The NRC Safety Evaluation Report explicitly stated that the operation of the Log Power Level Channels at power levels above 1E-4% of rated thermal power (RTP) is recognized to be inappropriate for technical specification requirements since on startup, the trips are bypassed. This led to the philosophy that above 1E-4% RTP with the DNBR, LPD, and RCS Flow trips enabled and able to perform their specified safety functions that a log power issue did not affect DNBR, LPD, and RCS Flow trip operability. The 1E-4% bistable which is actuated by log power has no adverse impact on DNBR, LPD, and RCS Flow trips above 1E-4% once the trips are enabled.

NRC issuance of Amendment No. 145 (ADAMS Accession No. ML0217904720) was intended to clarify the known TS Table 2.2-1 and 3.3-1 verbatim compliance issues associated with TS Table 3.3-1 log power. This change clarified the 1E-4% power level is associated with neutron power and not thermal power. This amendment did not change the NRC Amendment No. 40 philosophy.

The Maintenance Instrumentation procedures for Log Power testing and maintenance address the need to consider bypassing LPD and DNBR trip channel; however, the procedures do not specifically address the need to consider RCS Flow Low trip channel operability. The DNBR and LPD were included, not because their operability were believed to be affected, but as a conservative action because of the integrated circuitry could potentially cause an unnecessary DNBR and LPD bistable trip while performing test or maintenance activities on the associated Log Power channel. This requirement in TS Table 3.3-1 note C for operating bypasses to be automatically removed had been interpreted as being satisfied, not requiring the Log Power channel, when these operating bypasses are removed and disabled by their key switches removed.

CORRECTIVE ACTIONS

Operations Standing Order was put in place 8/31/09 to ensure that LPD, DNBR, and RCS Flow is bypassed or placed in trip condition when the associated Log Power channel is rendered inoperable in Modes 1 and 2, regardless if Log Power trip channel is required or if the operating bypasses are utilized.

A TS amendment request was submitted to NRC via Entergy Letter No. W3F1-2009-0045 (ADAMS Accession No. ML092990199) to clarify the TS related requirement of operating bypass to read, "shall be capable of automatic removal whenever the operating bypass is enabled and logarithmic power is above the 1E-4% bistable setpoint."

Changes to the maintenance procedures for Log Power are being finalized to address bypassing or placing RCS Flow Low in trip condition to ensure compliance with TS when the associated Log Power channel is rendered inoperable due to maintenance testing.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford 3 Steam Electric Station	05000382	2009	- 004 -	00	5 OF 5

NARRATIVE

Changes to the PPS Operations procedure are being made to address bypassing or placing RCS Flow Low in trip condition to ensure compliance with TS when the associated Log Power channel is rendered inoperable due to maintenance testing while a second Log Power channel is already inoperable.

SAFETY SIGNIFICANCE

Four PPS measurement channels with electrical and physical separation are provided for each parameter used in the direct generation of trip signals. A two-out-of-four coincidence of like trip signals is required to generate a reactor trip signal. The fourth channel is provided as an installed spare and allows bypassing of one channel while maintaining a two-out-of-three logic protection system. In these cases, where RCS Flow channel was not bypassed or placed in trip condition, the operating bypasses were not utilized, but maintained locked in the un-bypassed condition with key removed, such that the trip function was not affected by the associated log power channel being inoperable. Accordingly, there were no safety consequences associated with this condition.

SIMILAR EVENTS

A review of previous events was performed to identify similar licensee events at Waterford 3 reported in the last three years. There were no similar licensee events identified.

ADDITIONAL INFORMATION

Energy industry identification system (EIIS) codes are identified in the text within brackets [ ].