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Waterford 3

10 CFR 50.73

W3F1-2013-0051

September 3, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Subject: Licensee Event Report (LER) 2013-004-00
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) 2013-004-00 for Waterford Steam Electric Station, Unit 3 (Waterford 3). This report provides details associated with a violation of Technical Specifications during operation with reduced channels of excore nuclear instrumentation available.

Based on plant evaluation, it was determined that this condition is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

This report contains no new commitments. Please contact Bryan Pellegrin, Licensing Manager - Acting, at (504) 739-6203 if you have questions regarding this information.

Sincerely,

BJP/WH

Attachment: Licensee Event Report 2013-004-00

IE22
NRR

cc: Mr. Steven Reynolds, Regional Administrator (acting)
U.S. NRC, Region IV
RidsRgn4MailCenter@nrc.gov

U.S. NRC Project Manager for Waterford 3
Kaly.Kalyanam@nrc.gov

U.S. NRC Senior Resident Inspector for Waterford 3
Marlone.Davis@nrc.gov

Attachment to

W3F1-2013-0051

Licensee Event Report 2013-004-00

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 10/31/2013

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Waterford 3 Steam Electric Station	05000 382	1 OF 3

4. TITLE

Tech Spec Violation During Operation in Lower Mode with Reduced Channels of Excore Nuclear Instrumentation

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
4	29	2013	2013	- 004 -	00	9	3	2013	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

Mode 5

10. POWER LEVEL

000

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 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 Bryan Pellegrin	(504) 739-6203

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*)

A review of plant reactor coolant temperature trends from a planned outage shows that on April 29, 2013, reactor coolant temperature was raised from approximately 135 degrees F to approximately 180 degrees F as a planned evolution. On April 30, 2013, RCS temperature was raised from approximately 180 degrees F to approximately 345 degrees F as a planned evolution. Additionally, on April 30, 2013, plant operations involving water additions to the Volume Control Tank were conducted. A review of the Station Log shows that only one ENI log channel was operable during these evolutions. These evolutions were prohibited by the plant's Technical Specifications under these conditions.

TS 3.3.1 Action 4 requires, with only one log power channel operable in Mode 5 or Mode 4, suspending "all operations involving positive reactivity changes," and is clarified by an applicable note which states, "Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated shutdown margin."

Planned corrective action is to revise the TS bases for TS 3.3.1 to emphasize the limitations for usage of the note applicable to Action 4.

The planned heatup and dilution evolutions had no discernable effect on nuclear safety.

INITIAL CONDITIONS
Waterford Steam Electric Station, Unit 3 (Waterford 3), was commencing mode ascension at the end of a short planned outage. The plant was in Mode 5, Cold Shutdown. Only one of four channels of Excore Nuclear Instrumentation System (ENI) [IG] log power was operable. Operations personnel had entered Technical Specification (TS) 3.3.1 Action 4 for this condition.

EVENT DESCRIPTION
A review of plant temperature trends from the planned outage shows that on April 29, 2013, Reactor Coolant system (RCS) [AB] temperature was raised from approximately 135 degrees F to approximately 180 degrees F as a planned evolution. On April 30, 2013, RCS temperature was raised from approximately 180 degrees F to approximately 345 degrees F as a planned evolution, entering Mode 4. Additionally, on April 30, 2013, plant operations involving water additions to the Volume Control Tank (VCT) [TK] were conducted. A review of the Station Log shows that only one ENI log channel was operable during these evolutions. These conditions were identified in the site corrective action program as CR-WF3-2013-2166 and CR-WF3-2013-3182.

REPORTABLE OCCURRENCE
10 CFR 50.73(a)(2)(i)(B) requires a Licensee Event Report (LER) for any operation or condition that was prohibited by the plant's Technical Specifications.

With only one log power channel operable in Mode 5 or Mode 4, TS 3.3.1 Action 4 requires suspending "all operations involving positive reactivity changes," and is clarified by an applicable note which states "Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated shutdown margin."

The plant heatups conducted on April 29, 2013 and on April 30, 2013 raised RCS temperature above the temperature band in effect when TS 3.3.1 Action 4 was entered. This is beyond the allowance of the applicable note, which does not discuss allowing plant heatup, only limited plant cooldown or boron dilution.

The water additions to the VCT were performed with the RCS at high boron concentration. While higher boron concentration does improve shutdown reactivity, if too high it can cause a positive moderator temperature coefficient condition. Though shutdown margin was verified, the Operations crew did not determine prior to the evolution whether a positive moderator temperature coefficient condition existed in the core.

These evolutions were prohibited by the plant's TSs. As such, these conditions are reportable as an LER.

BACKGROUND – SYSTEM DESIGN
Waterford 3 is a Combustion Engineering design pressurized water reactor [AC] with two recirculating type steam generators [SG].

The ENI log safety instruments consist of four channels which provide neutron flux information from near startup neutron flux levels to 200 percent of rated power covering a single range of approximately 2E-8 to 200 percent power (10 decades). Although the channels provide input to the Plant Protection System [JC] for reactor trip, this function is bypassed in lower operating modes with the reactor trip breakers open.

CAUSAL FACTORS
Interviews with Operations personnel determined that shift personnel and outage management personnel were cognizant of the applicability of the note associated with TS 3.3.1 Action 4 for log safety channels. Operations personnel had also read the applicable TS bases information. However, licensed operators both on shift and in outage management positions incorrectly interpreted the meaning of the note. The note states, "Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated shutdown margin." Licensed operators interpreted this to mean that, as long as a current shutdown margin (SDM) calculation is performed which shows that the planned evolution is within the shutdown margin limits, then the evolution may be

conducted with only one log safety channel operable.

The note being examined was introduced into TS through TS Amendment 185, which was received onsite in March of 2003. According to the accompanying NRC safety evaluation, TS 3.3.1 Action 4, "would be modified by a note allowing controlled plant operations that may result in limited reactivity additions (e.g., temperature or boron fluctuations associated with RCS inventory management or temperature control), provided they are accounted for in the calculated SDM. This would maintain the required SDM and limit any potential reactivity additions to acceptable levels." The safety evaluation further documents "These activities constitute small positive reactivity changes that are precluded by the current TSs. However, these activities should not be precluded if the worst-case overall effect on the core would still assure the required SDM (or the required refueling boron concentration) is maintained. Therefore, the proposed changes provide the flexibility necessary to ensure continued safe reactor operations, while also limiting any potential for excess positive reactivity addition."

When TS Amendment 185 was implemented, the information placed in the TS Bases document did not emphasize the limitations for usage of the note, such as maintenance of the current condition or for limited plant cooldown or boron dilution. The absence of this information in the TS bases was a missing barrier.

EXTENT OF CONDITION
Lower mode evolutions conducted over the past three years where TS 3.3.1 Action 4 was invoked for log safety channels were examined to determine if improper usage of the note limitations occurred. No other evolutions were found.

CORRECTIVE ACTIONS
TS bases for TS 3.3.1 will be revised to emphasize the limitations for usage of the note, including consideration for positive moderator temperature coefficient (CR-WF3-2013-3004).

SAFETY SIGNIFICANCE
Industrial Safety: There was no industrial safety significance associated with this issue.

Radiological Safety: There was no radiological safety significance associated with this issue.

Nuclear Safety: Prior to each of the two plant heatups and prior to the water addition to the VCT while only one log safety channel was operable, Operations personnel performed and documented shutdown margin calculations which accounted for reactivity changes expected during each heatup. Shutdown margin was verified in each case. In addition, during the evolutions reactor power was monitored by the Operations crew on the one operable log safety channel and two operable ENI startup channels. No change in power was noted. Therefore, the evolutions had no discernable effect on nuclear safety.

SIMILAR EVENTS
A search was performed using the NRC's ADAMS search engine for other similar reported events at Waterford 3. No similar events were identified.

ADDITIONAL INFORMATION
Energy industry identification system (EIIS) codes and component function identifiers are identified in the text with brackets [ ].

Reporting Date Discussion
The difference between the event date and report date exceeds 60 days because this condition was not recognized as a reportable condition until another review was performed of the available information. This condition was identified on July 3, 2013 under CR-WF3-2013-3182 and was subsequently found to be reportable.