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Robert J. Murillo
Licensing Manager
Waterford 3

W3F1-2009-0036

July 29, 2009

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

Subject: Licensee Event Report 09-002-00
Waterford Steam Electric Station, Unit 3 (Waterford 3)
Docket No. 50-382
License No. NPF-38

Dear Sir or Madam:

Entergy is hereby submitting voluntary Licensee Event Report (LER) 09-002-00 for Waterford Steam Electric Station Unit 3. This report provides details associated with a shortened service life of Station Battery 'B' due to apparent manufacturing impurities. The condition is reported herein as a voluntary report because the issue is of generic interest.

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

Sincerely,

RJM/RJP

Attachment: Licensee Event Report 09-002-00

IE22
NRR

(w/Attachment)
cc: Mr. Elmo E. Collins, Jr.
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

NRC Senior Resident Inspector
Waterford Steam Electric Station Unit 3
P.O. Box 822
Killona, LA 70066-0751

U. S. Nuclear Regulatory Commission
Attn: Mr. N. Kalyanam
Mail Stop O-07D1
Washington, DC 20555-0001

Wise, Carter, Child & Caraway
ATTN: J. Smith
P.O. Box 651
Jackson, MS 39205

Winston & Strawn
ATTN: N.S. Reynolds
1700 K Street, NW
Washington, DC 20006-3817

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ATTN: T.C. Poindexter
1111 Pennsylvania Avenue, NW
Washington, DC 20004

Louisiana Department of Environmental Quality
Office of Environmental Compliance
Surveillance Division
P. O. Box 4312
Baton Rouge, LA 70821-4312

R.K. West, lerevents@inpo.org - INPO Records Center

	(w/Attachment)	
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	C.F. Arnone	(W-MSB4-300)
	K. Christian	(W-GSB-318)
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	K.S. Cook	(W-MSB4-336)
	J.F. McCann	(K-WPO-12C)
	B. Ford	(M-ECH-42)
	B.R. Lanka	(W-GSB-315)
	M. Schaible	(W-EEC-650)
	D.R. Morris	(W-GSB-350)
	R.J. Murillo	(W-GSB-318)
	S.L. Anders	(W-ADM-500)
	W.E. McKinney	(W-GSB-102)
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	C. Fugate	(W-MSB4-217)
	R.G. Putnam	(W-MSB4-220)
	C.L. Alday	(W-GSB-201)
	J.J. Lewis	(W-GSB-365)
	A.B. Pilutti	(W-MSB4-244)
	J.L. Hornsby	(W-MSB4-238)
	(w/Attachment)	
bcc:	Waterford 3 Records Center	(W-GSB-100)
	Licensing Green Folder File	

Attachment

W3F1-2009-0036

Licensee Event Report 2009-002-00

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

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.

LICENSEE EVENT REPORT (LER)

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

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4. TITLE

Voluntary Report: Shortened Service Life of Station Battery 'B' due to Manufacturing Impurities

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
05	22	2008	2009	- 002 -	00	07	29	2009	FACILITY NAME NA	DOCKET NUMBER 05000

9. OPERATING MODE

6

10. POWER LEVEL

00

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 Richard J. Pollock	(504) 739-6561

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)

This is a voluntary LER to report an issue of generic interest. During Refuel 15, Station Battery 'B' [EJ] was disconnected from the bus to perform testing. On 5/16/2008, at approximately 20:00 hours, a performance test on the battery showed that battery capacity was at 86.25% of the manufacturer rating. Since the average of previous performance tests was 103.7%, a degraded battery was indicated based on the capacity dropping more than 10% from its average on previous performance tests. Station Battery 'B' was manufactured by C&D Battery and was installed in October 1992. The rated service life of the battery is 20 years. The battery had been in-service for 15.6 years prior to the performance test on 5/16/08. A confirmatory performance discharge test on 5/22/2008 revealed the battery had prematurely aged and required replacement. Measured capacity on 5/22/2008 was 71.67%. Although not applicable in modes 5 or 6, Technical Specification Surveillance Requirement (SR) 4.8.2.1.e requires battery capacity be at least 80% of the manufacturer's rating. The plant was in Mode 6 with the Station Battery 'B' disconnected from the plant from 5/16/2008 until replaced with new LCR-33 cells manufactured by C&D Battery on 5/24/2008. A Root Cause Evaluation determined the most probable cause for the Station Battery 'B' prematurely aging was impurities introduced during manufacturing.

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NARRATIVE

REPORTABLE OCCURRENCE

There is no reportable occurrence per the reporting requirements outlined in Title 10 of the Code of Federal Regulations. The condition is a voluntary LER to report an issue of generic interest.

INITIAL CONDITIONS

The plant was in Mode 6 conducting refueling operations during Refuel 15 when this apparent condition occurred. This plant condition did not contribute to this event. There were no other structures, systems, or components inoperable at the start of the event or that contributed to the event. Performance testing on Station Batteries 'A' and 'AB' demonstrated acceptable performance.

EVENT DESCRIPTION

During Refuel 15, Station Battery 'B' [EJ] was disconnected from the bus to perform testing. On 5/16/2008 at approximately 20:00 hours, Waterford 3 conducted a performance test of Station Battery 'B'. The results of the performance test showed that the battery capacity had degraded to 86.25% of the manufacturer's rating. Since the average of previous performance tests was 103.7%, a degraded battery was indicated based on the measured battery capacity dropping more than 10% of the rated capacity from its average on previous performance tests. Although not applicable in modes 5 or 6, Technical Specification Surveillance Requirement (SR) 4.8.2.1.f requires annual performance discharge tests for any battery that shows signs of degradation.

The station battery 'B' is made up of 60 individual LCUN-33 cells that were manufactured by C&D Battery and installed in October 1992. The rated service life of the battery is 20 years. The battery had been in-service for 15.6 years prior to the performance test on 5/16/08. A confirmatory performance discharge test on 5/22/2008 revealed the battery had prematurely aged and required replacement. Measured capacity on 5/22/2008 was 71.67%. Although not applicable in modes 5 or 6, Technical Specification Surveillance Requirement (SR) 4.8.2.1.e requires battery capacity be at least 80% of the manufacturer's rating.

The plant was in Mode 6 with the Station Battery 'B' disconnected from the plant from 5/16/2008 until replaced with new LCR-33 cells manufactured by C&D Battery on 5/24/2008. The Technical Specifications did not require this battery bank while the plant was in Mode 6 and disconnected from the bus.

The report date for this LER exceeds 60 days from the event date because this condition is being reported as a voluntary LER to report an issue of generic interest and identification that this issue is of generic interest has recently been determined.

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NARRATIVE

CAUSAL FACTORS

A Root Cause Evaluation determined the most probable cause for the Station Battery 'B' premature aging was impurities introduced during the manufacturing process.

The cells used in the Station Battery 'B' were manufactured by C&D Batteries in October 1992, to the same specification as the cells used in Station Batteries 'A' and 'AB'. Performance tests of Station Batteries 'A' and 'AB' also performed in Refuel 15 indicated no similar degradation had occurred.

Aging and Degradation Mechanisms identified in the EPRI Station Battery Guide for vented lead-acid batteries are reasonably well understood by the industry. The Aging and Degradation Mechanisms that will limit battery life and performance that were evaluated were Temperature, Discharge Cycle Service, Overcharging, Undercharging and Impurities.

All aging and degradation mechanisms were eliminated except for 'impurities introduced by the manufacturer.' The battery maintenance performed at Waterford 3 is in accordance with industry standards and is performed on all three Station Batteries. Additional testing to validate the most probable cause was not possible because the degraded battery cells were removed from the site during Station Battery 'B' replacement and subsequently disposed of.

CORRECTIVE ACTIONS

The entire Station Battery 'B' bank was replaced with LCR-33 cells manufactured by C&D Battery. The new Station Battery 'B' successfully passed post installation testing and met all operability requirements.

SAFETY SIGNIFICANCE

The Station Batteries are sized in accordance with IEEE Std 485, IEEE Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations. The sizing of the Station Batteries allows for compensation of age when actual capacity drops to 80% of manufacturers rating with an additional design margin of 10%. Based on the 'as-found' results of the initial Refuel 15 Station Battery 'B' performance test, the battery was capable of meeting the requirements of the service test that meets the design basis for operability. The Station Battery 'B' was disconnected from the bus for planned maintenance at the time of the 5/26/2008 performance test. The Station Battery 'B' was replaced prior to returning it to service.

Technical Specification limiting conditions for operation were satisfied for Mode 6 with an operable Station Battery Bank 'A' and its associated full capacity charger. There was no negative impact on the availability of systems or components needed to maintain safe shutdown conditions, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident.

Based on the above discussion, there was no increased challenge to nuclear, radiological or industrial safety.

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NARRATIVE

SIMILAR EVENTS

There have been no previous, similar licensee events reported in the last three years.

ADDITIONAL INFORMATION

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