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Robert J. Murillo
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Waterford 3

W3F1-2008-0071

November 3, 2008

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

Subject: Licensee Event Report 08-004-00
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) 08-004-00 for Waterford Steam Electric Station Unit 3. This report provides details associated with the discovery of loose bolts on an intercell connection on 125 vdc Station Battery 3B-S, which resulted in low battery cell voltage. The condition is being reported herein as a voluntary LER.

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

Sincerely,

RJM/OPP/ssf

Attachment: Licensee Event Report 08-004-00

IE22
NRR

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
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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

Attachment

W3F1-2008-0071

Licensee Event Report 08-004-00

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

Loose Intercell Connecting Bolts on 125 vdc Station Battery.

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
09	02	2008	2008	- 004 -	00	11	3	2008	FACILITY NAME NA	DOCKET NUMBER 05000

9. OPERATING MODE

4

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 Voluntary LER
☐ 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 September 3, 2008, at approximately 0105 hours, with the plant in MODE 4 (associated with Hurricane Gustav), Operations declared 125 vdc Station Battery 3B-S INOPERABLE due to low voltage and entered Technical Specification 3.8.2.1. Loose bolts were discovered on an intercell connector connecting two of the 60 battery cells. The bolts were immediately tightened, and satisfactory intercell resistance readings were verified. The battery was declared OPERABLE on September 3, 2008 at 0430 hours. A search of records and conduct of personnel interviews did not provide objective evidence as to the cause for the loose connection. Station Battery 3B-S was replaced during Refuel 15 (May of 2008). Prior to start up from Refuel 15, one of the battery cells, near the loose bolt connection, had to be replaced due to the cell not holding an adequate charge. Station Battery 3B-S was satisfactorily load tested and declared OPERABLE during Refuel 15. It is possible the bolts were left loosened during the replacement of the battery cell. The clamping force from adjacent bolts was sufficient to pass the battery load test and to declare the battery OPERABLE. The high resistance at the loose connection is judged to have developed gradually over time. The point in time that an unacceptable intercell resistance formed at the loose connection could not be determined as it is not observable by weekly battery surveillances which provided satisfactory results. The condition is being voluntarily reported to communicate operating experience to the NRC and nuclear industry. The condition did not involve a Safety System Functional Failure since the Station Battery 3A-S was unaffected and offsite power was available. The condition did not compromise the health and safety of the general public.

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NARRATIVE

REPORTABLE OCCURRENCE

On September 3, 2008 at approximately 0105, Station Battery 3B-S was declared INOPERABLE due to low voltage, and Technical Specification 3.8.2.1 was entered. Technical Specification 3.8.2.1 is applicable in MODES 1, 2, 3, and 4. The plant was in MODE 4 at the time of discovery. Technical Specification ACTION 'a.' states that, "With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours." The condition was corrected in 3 hours and 25 minutes by adequately torquing the bolts. The requirements of Technical Specification 3.8.2.1 were met. A review of records and personnel interviews did not provide objective evidence as to the cause for the loose connection. It is possible that the bolts were left loosened and not retightened during replacement of a nearby battery cell (56) during Refuel 15 (May 2008). The clamping force, on the link bars, from the bolts at the adjacent battery cell post was sufficient to pass the battery load test and to declare Station Battery 3B-S OPERABLE. The high resistance at the loose bolt connection is judged to have gradually developed over time. The point in time that an unacceptable intercell resistance formed at the loose bolt connection could not be determined as it is not observable by normal weekly battery surveillances which provided satisfactory results. Therefore, in accordance with the guidance provided in NUREG 1022, time of discovery is applicable. The condition is herein being voluntarily reported to communicate operating experience to the NRC and nuclear industry.

INITIAL CONDITIONS

At the time of discovery, the plant was in Mode 4 during the Hurricane Gustav forced outage. There were no other structures, systems, or components INOPERABLE at the time of discovery that contributed to the condition.

EVENT DESCRIPTION

On September 2, 2008 at approximately 2200 hours, during a weekly surveillance of Station Battery [BTRY] 3B-S, voltages for both pilot cells (30 and 57) were found to be below acceptance criteria values prescribed in the surveillance procedure (ME-003-200). Pilot cell 30 was found to be at 2.067 vdc. Pilot cell 57 was found to be at 2.063 vdc. A check of 10 additional cells yielded the same approximate results. Trouble shooting activities identified a loose connection at cell 57 negative posts intercell connector, which connects to cell 58 positive posts. At approximately 0105 hours, Operations declared Station Battery 3B-S INOPERABLE due to low voltage (less than 2.07 Volts), and Technical Specification 3.8.2.1 was entered.

Immediate action was taken to tighten the bolts. One of the two loose bolts on the battery cell negative post was 6.5 flats loose. The other loose bolt was 16 flats loose, less than finger tight. The bolts have six flats. At 0430 hours, Operations declared Station Battery 3B-S OPERABLE and exited Technical Specification 3.8.2.1.

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NARRATIVE

CAUSAL FACTORS

The root cause analysis identified the cause of the condition as a failure to maintain plant equipment status control due to a lack of specific work instructions and a lack of work order documentation of intercell connectors that were loosened or removed. Record searches and personnel interviews did not provide objective evidence as to the cause for the loose connection. It is possible that the bolts were left loosened during Refuel 15 (May 2008) when cell 56 in Station Battery 3B-S was replaced. Cell 56 was replaced during Refuel 15 after it was determined that the cell would not maintain an adequate charge. For reference information, all of the sixty cells of Station Battery 3B-S had earlier been replaced during the same refueling outage (Refuel 15). When cell 56 was replaced, work instructions with sufficient specificity were not included in the work package necessary to document the removal and reinstallation of each intercell connector for cells 54, 55, 56 and 57.

CORRECTIVE ACTIONS

- Station Battery 3B-S negative post bolts on cell 57 were appropriately torqued.
- Torque and intercell resistance checks were made for all Station Battery 3B-S intercell and inter-tier connections. No other loose connections on Station Battery 3B-S were identified.
- Additional checks were performed on the battery which included individual cell voltage and specific gravity checks of each installed cell. No abnormalities were noted.
- Precautionary checks of Station Battery 3A-S and 3AB-S torque and intercell resistance were completed. No abnormalities were noted on either battery.
- A level 1 human performance error review was performed with appropriate personnel.
- Other actions are being evaluated and conducted as appropriate in accordance with the Corrective Action Program (CR-WF3-2008-04179).

SAFETY SIGNIFICANCE

The safety function for Station Battery 3B-S is, in conjunction with the 'B' battery chargers, to provide reliable continuous DC power to the 'B' train of reactor control (SUPS-3B), plant protection system (SUPS-MB and SUPS-MD), and DC powered safe shutdown equipment, including power to start the 'B' train Emergency Diesel Generator. Should AC power be lost, Station Battery 3B-S provides the source of power for safety related DC loads and uninterruptible power supplies until AC power is restored. Peak load on the battery is 692 amps, and the peak load occurs as the Emergency Diesel Generator 'B' is started within the first few seconds of a loss of AC power.

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The 'B' train safety related battery is located in a separate room in the Reactor Auxiliary Building which is a Seismic Category I structure which provides protection from potential missile hazards. Station Battery 3B-S and associated DC loads are physically and electrically separated from Station Battery 3A-S (two redundant trains) such that the loss of either train will not prevent the minimum safety function from being performed. Since only Station Battery 3B-S was replaced in RF15 and based on finding no other loose intercell connections with Station Battery 3A-S and Station Battery 3AB-S, there is no common cause failure.

Technical Specification 3.8.2.1 requires 125-volt Station Battery 3B-S and one associated full capacity charger (3B1-S or 3B2-S) to be Operable in Modes 1-4. The battery passed its Service Discharge Test on May 26, 2008 and demonstrated its capability to meet its safety function to supply required loads for at least 4 hours.

At the time of discovery on September 2, 2008, 'A' train offsite power and all mitigating systems were available. 'B' Train offsite power had been declared inoperable on September 1, 2008 due to high bus voltages. However, the bus was available to provide offsite power. Additionally, a temporary Emergency Diesel Generator capable of supplying the Train 'B' safety loads was onsite and staged. The loose connection was tightened, and the battery was restored to operable status within 6 hours from time of discovery.

There is no Industrial or Radiological Safety Significance associated with the event discussed in this LER. The condition did not compromise public health and safety.

SIMILAR EVENTS

A record search was performed for other similar reported events at Waterford 3. No similar events were reported over the last 3 years.

ADDITIONAL INFORMATION

Energy Industry Identification System (EIIS) codes are identified in the text within brackets [ ].