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Docket No. 50-366

HL-6025


U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Edwin I. Hatch Nuclear Plant - Unit 2  
Licensee Event Report  
Low Station Service Battery Room Temperatures  
Result in Entry Into LCO 3.0.3

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning low station service battery room temperatures which resulted in an entry into LCO 3.0.3.

Respectfully submitted,

  
H. L. Sumner, Jr.

CLT/eb

Enclosure: LER 50-366/2000-009

cc: Southern Nuclear Operating Company  
Mr. P. H. Wells, Nuclear Plant General Manager  
SNC Document Management (R-Type A02.001)

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IE22

## LICENSEE EVENT REPORT (LER)

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

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## FACILITY NAME (1)

Edwin I. Hatch Nuclear Plant - Unit 2

## DOCKET NUMBER (2)

05000-366

## PAGE (3)

1 OF 5

## TITLE (4)

Low Station Service Battery Room Temperatures Result In Entry Into LCO 3.0.3

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 NAME	DOCKET NUMBER(S)
11	22	2000	2000	009	00	12	19	2000		05000
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § : (Check one or more) (11)							
1			20.2201(b)		20.2203(a)(2)(v)		X		50.73(a)(2)(i)	50.73(a)(2)(vii)
POWER LEVEL (10)			100		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)	50.73(a)(2)(ix)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)				50.73(a)(2)(iii)	73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)				50.73(a)(2)(iv)	OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)				50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)				50.73(a)(2)(vii)	

## LICENSEE CONTACT FOR THIS LER (12)

## NAME

Steven B. Tipps, Nuclear Safety and Compliance Manager, Hatch

## TELEPHONE NUMBER (Include Area Code)

(912) 367-7851

## COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

## SUPPLEMENTAL REPORT EXPECTED (14)

YES

(If yes, complete EXPECTED SUBMISSION DATE)

X NO

## EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

## ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-space typewritten lines) (16)

On 11/22/2000 at 0930 EST, Unit 2 was in the Run mode at a power level of 2763 CMWT (100 percent rated thermal power). At that time, personnel performing daily rounds discovered the temperatures in the 2A and 2B station service battery rooms were below their minimum limit of 65°F. The temperature in the 2A battery room was 60°F and the temperature in the 2B battery room was 63°F. The Unit 2 Technical Specifications require the battery cell electrolyte temperature to be  $\geq 65^\circ\text{F}$ . Operations personnel assumed conservatively that the cell electrolyte temperature was approximately the same as the room temperature and therefore below the minimum required temperature. At 1500 EST, personnel declared the batteries inoperable, effective at the time of the initial recording of the room temperatures. With both batteries inoperable, personnel entered Condition E of Unit 2 Technical Specifications Limiting Condition for Operation (LCO) 3.8.4, which, in turn, required entry into LCO 3.0.3. At 1530 EST, the batteries were declared operable and Condition E and LCO 3.0.3 were exited after the cell electrolyte temperatures were determined to be greater than 65°F.

The cause of this event was inadequate procedures. Procedures did not require the heating coil for the battery room ventilation system to be placed into service during cold weather. Personnel placed the heating coil into service causing temperature in the battery rooms to increase to greater than 70°F by 0544 EST on 11/23/2000. The procedures will be revised. The Unit 1 station service battery room heating system is of a different design; therefore, no similar corrective actions are required.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System codes appear in the text as (EIS Code XX).

DESCRIPTION OF EVENT

On 11/22/2000 at 0930 EST, Unit 2 was in the Run mode at a power level of 2763 CMWT (100 percent rated thermal power). At that time, a non-licensed System Operator performing daily rounds per plant procedure 34GO-OPS-030-2S, "Daily Inside Rounds," discovered that the temperatures in the 2A and 2B station service battery (EIS Code EJ) rooms were below their minimum procedural limit of 65 degrees Fahrenheit. Procedure 34GO-OPS-030-2S requires personnel to check and record station service battery room temperatures once a day. The System Operator found the temperature in the 2A battery room was 60 degrees Fahrenheit and the temperature in the 2B battery room was 63 degrees Fahrenheit.

Unit 2 Technical Specification Surveillance Requirement SR 3.8.6.3 requires the station service battery cell electrolyte temperature to be at or above 65 degrees Fahrenheit. After being informed of the low battery room temperatures, licensed Operations personnel assumed conservatively that the cell electrolyte temperature would be approximately the same as the room temperature and therefore was below the minimum temperature required by SR 3.8.6.3. Consequently, at 1500 EST, Operations personnel declared the 2A and 2B station service batteries inoperable effective at 0930 EST, the time of the initial recording of the room temperatures by the System Operator.

With both station service DC electrical power subsystems inoperable, Operations personnel entered Condition E of Unit 2 Technical Specifications Limiting Condition for Operation 3.8.4. This Condition and its associated Required Action directed immediate entry into Limiting Condition for Operation 3.0.3, which, in turn, required the unit to be in Mode 2 by 1630 EST. However, at 1530 EST, Operations personnel declared the 2A and 2B station service batteries operable, and exited Condition E and Limiting Condition for Operation 3.0.3, after personnel determined that both the battery room and cell electrolyte temperatures were greater than 65 degrees Fahrenheit. Nevertheless, Operations personnel initiated frequent checks of battery room and battery cell electrolyte temperatures until the cause for the unexpectedly low room temperatures could be determined and corrected.

Maintenance personnel investigated the low battery room temperatures per Maintenance Work Order 2-00-2750. They discovered that room ventilation (EIS Code VF) heat coiling 2Z41-B022 was not in service because hot water supply (EIS Code LV) bypass valve 2P51-F961 was in the open position. Operations personnel throttled closed bypass valve 2P51-F961 at 2358 EST per Caution 1-00-122. Subsequent checks confirmed increasing station service battery room temperatures: at 0043 EST on 11/23/2000, the 2A and 2B battery room temperatures were 67 degrees Fahrenheit and 71 degrees Fahrenheit, respectively. By 0544 EST, the 2A and 2B battery room temperatures were 71 degrees Fahrenheit and 74.3 degrees Fahrenheit, respectively.

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CAUSE OF EVENT

The cause of this event was inadequate procedures. Neither procedure 34SO-P51-002-2S, "Instrument and Service Air Systems," nor department instruction DI-OPS-36-0989N, "Cold Weather Checks," required the heating coil for the station service battery room ventilation system, 2Z41-B022, to be placed into service during periods of cold weather. Specifically, neither procedure required hot water supply bypass valve 2P51-F961 to be closed so hot water could be directed to the heating coil. Moreover, the normal valve lineup contained in Attachment 14 to procedure 34SO-P51-002-2S required valve 2P51-F961 to be open without regard to outside air temperature.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73 (a)(2)(i) because a condition existed which was prohibited by the plant's Technical Specifications. Specifically, with both station service batteries inoperable, the unit was required to enter Limiting Condition for Operation 3.0.3. Per the guidance given in NUREG-1022, Revision 1 (section 3.2.2, page 30, item 6), entry into Limiting Condition for Operation 3.0.3 must be reported as a condition prohibited by the plant's Technical Specifications.

The station service batteries provide both motive and control power to selected safety related and non-safety related equipment. One 125/250V station service battery and three battery chargers, two in service and one in standby, energize each DC power supply subsystem (EISS Code EJ). Each battery has adequate storage capacity to carry the required accident loads for approximately two hours and is sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life. However, lower than normal battery cell electrolyte temperatures act to inhibit or reduce battery capacity. Therefore, the Technical Specifications require that the cell electrolyte temperatures be at or above 65 degrees Fahrenheit for the battery to be considered operable.

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**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

In this event, the 2A and 2B station service battery room temperatures were found to be below 65 degrees Fahrenheit. Operations personnel conservatively assumed that battery cell electrolyte temperature was approximately equal to battery room temperature and therefore concluded that electrolyte temperature also was below 65 degrees Fahrenheit. They accordingly declared the station service batteries inoperable and entered Limiting Condition for Operation 3.0.3 as required by the Technical Specifications. However, the batteries remained connected to their respective DC busses and capable of providing DC power to required loads in the event of an accident. The only effect of the presumed low battery cell electrolyte temperature would have been to reduce battery capacity, although the reduction would have been minor and capacity remained within that assumed by the Unit 2 Final Safety Analysis Report and the Technical Specification Bases.

According to the Institute of Electrical and Electronics Engineers (IEEE) standard 450-1995, "Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," the lower temperatures would have had only minimal effect on battery capacity. The difference in the temperature correction factors for 65 degrees Fahrenheit and 60 degrees Fahrenheit is only three percent (1.080 to 1.110 relative to a correction factor of 1.000 for the standard cell reference temperature of 77 degrees Fahrenheit; reference Table 1 of IEEE standard 450-1995). That is, the cell capacity is reduced only three percent when electrolyte temperature drops from 65 degrees Fahrenheit to 60 degrees Fahrenheit. Three percent of two hours is only 5.4 minutes or less than 0.10 hours. Therefore, battery capacity, even at the lower electrolyte temperature, would have been within the required "approximately" two-hour capacity as stated in Unit 2 Final Safety Analysis Report section 8.3.2.1.1 ("... each battery has adequate storage capacity to carry the required load for approximately 2 h") and Unit 2 Technical Specification Bases B 3.8.4 ("Each battery had adequate storage capacity to carry the required load continuously for approximately 2 hours"). More importantly, actual battery capacity exceeded the required capacity by a margin significantly greater than three percent.

The combined service and performance testing of the 2B and 2A station service batteries completed in July 2000 and September 1998, respectively, indicated that actual battery capacities were greater than 102 percent of the manufacturer rating. In contrast, Unit 2 Technical Specification Surveillance Requirement SR 3.8.4.8 requires only that battery capacity be greater than 80 percent of the manufacturer rating. Moreover, test duration was at least three hours, proving each battery had load-carrying capacity far in excess of the two-hour limit imposed by the Unit 2 Final Safety Analysis Report and Technical Specification Bases. This excess capacity was more than adequate to compensate for the minor loss that would have resulted from the presumed lower electrolyte temperature.

Another mitigating factor to this event is that the act of the battery supplying bus loads likely would have served to increase cell electrolyte temperature to above 65 degrees Fahrenheit. That is, the resulting current flow through the battery could have created enough heat within the cells to increase the electrolyte temperature the two to five degrees needed to meet the minimum temperature requirement of 65 degrees Fahrenheit. Therefore, even the minor capacity lost as a result of this event likely would have been regained while the station service batteries were discharging and increasing cell electrolyte temperature.

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Based on the preceding analysis, it is concluded that this event had no adverse impact on nuclear safety. This analysis applies to all operating conditions.

**CORRECTIVE ACTIONS**

Operations personnel closed hot water supply bypass valve 2P51-F961 at 2358 EST per Caution 1-00-122. This action resulted in temperatures in the 2A and 2B station service battery rooms increasing to greater than 70 degrees Fahrenheit by 0544 EST on 11/23/2000.

Procedure 34SO-P51-002-2S and department instruction DI-OPS-36-0989N will be revised to require valve 2P51-F961 to be closed during periods of cold weather. Until these revisions can be made effective, Caution 1-00-122 will remain in effect.

The Unit 2 Final Safety Analysis Report paragraph 9.4.7.2.6, concerning the ventilation system for the battery rooms, will be revised to include a description of the heating coil used to maintain the minimum temperature in the battery rooms, thereby maintaining the required battery capacity during periods of cold weather.

The Unit 1 station service battery room heating system (EIS Code VF) is a different design; that is, electric heaters located in the battery rooms are used to maintain room temperatures above 65 degrees Fahrenheit. Indeed, a check of the daily readings of Unit 1 station service battery room temperatures since 01/01/1999 revealed no room temperature lower than 74 degrees Fahrenheit. Therefore, no corrective actions are required for Unit 1.

**ADDITIONAL INFORMATION**

1. Other Systems Affected: No systems other than those mentioned in this report were affected by this event.
2. Failed Components Information: No failed components caused or resulted from this event.
3. Commitments: No permanent commitments are created as a result of this report.
4. Previous Similar Events: There was one previous similar event reported in the last two years in which Limiting Condition for Operation 3.0.3 was entered. In that event, reported in Licensee Event Report 50-321/2000-010, dated 10/18/2000, two low pressure coolant injection subsystems were rendered inoperable at the same time. The Technical Specifications require entry into Limiting Condition for Operation 3.0.3 in this condition. Corrective actions for the previous similar event could not have prevented this event because they addressed circumstances, causes, and equipment different than those associated with this event.