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May 21, 2003

Docket Nos.: 50-321  
50-366

NL-03-1094

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant  
Licensee Event Report  
Plant Service Water Valve Found Closed Requiring  
Emergency Core Cooling Systems to be Declared Inoperable

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i)(B), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning a Plant Service Water valve which was found closed, resulting in inoperable emergency core cooling systems.

Sincerely,

A handwritten signature in black ink that reads "Lewis Sumner". The signature is written in a cursive, flowing style.

H. L. Sumner, Jr.

HLS/OCV/daj

Enclosure: LER 2-003-001

cc: Southern Nuclear Operating Company  
Mr. J. D. Woodard, Executive Vice President  
Mr. G. R. Frederick, General Manager – Plant Hatch  
Document Services RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission  
Mr. L. A. Reyes, Regional Administrator  
Mr. S. D. Bloom, NRR Project Manager – Hatch  
Mr. N. P. Garrett, Acting Senior Resident Inspector – Hatch

IE22

NRC FORM 366 (7-2001)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104      EXPIRES 7/31/2004 Estimated burden per response to comply with this mandatory information collection request: 50 hrs. 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,				
<b>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)								
1. FACILITY NAME Edwin I. Hatch Nuclear Plant - Unit 2				2. DOCKET NUMBER 05000-366		3. PAGE 1 OF 5		
4. TITLE Plant Service Water Valve Found Closed Requiring Emergency Core Cooling Systems to be Declared Inoperable								
5. EVENT DATE			6. LER NUMBER		7. REPORT DATE		8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR
03	25	2003	2003	001	0	05	24	2003
							FACILITY NAME Plant Hatch - Unit 1	
							DOCKET NUMBER(S) 05000-321	
							FACILITY NAME DOCKET NUMBER(S) 05000	
9. OPERATING MODE (9)		4		11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § : (Check all that apply)				
10. POWER LEVEL		0		20.2201(b)      20.2203(a)(3)(ii)      50.73(a)(2)(ii)(B)      50.73(a)(2)(ix)(A)				
				20.2201(d)      20.2203(a)(4)      50.73(a)(2)(iii)      50.73(a)(2)(x)				
				20.2203(a)(1)      50.36(c)(1)(i)(A)      50.73(a)(2)(iv)(A)      73.71(a)(4)				
				20.2203(a)(2)(i)      50.36(c)(1)(ii)(A)      50.73(a)(2)(v)(A)      73.71(a)(5)				
				20.2203(a)(2)(ii)      50.36(c)(2)      50.73(a)(2)(v)(B)      OTHER				
				20.2203(a)(2)(iii)      50.46(a)(3)(ii)      50.73(a)(2)(v)(C)      Specify in Abstract below or in NRC Form 366A				
				20.2203(a)(2)(iv)      50.73(a)(2)(i)(A)      50.73(a)(2)(v)(D)				
				20.2203(a)(2)(v)      X      50.73(a)(2)(i)(B)      50.73(a)(2)(vii)				
				20.2203(a)(2)(vi)      50.73(a)(2)(i)(C)      50.73(a)(2)(viii)(A)				
				20.2203(a)(3)(i)      50.73(a)(2)(ii)(A)      50.73(a)(2)(viii)(B)				
12. LICENSEE CONTACT FOR THIS LER								
NAME Steven B. Tipps, Nuclear Safety and Compliance Manager, Hatch						TELEPHONE NUMBER (Include Area Code) (912) 537-5880		
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT								
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT
X	BI	ISV	M120	Yes				
14. SUPPLEMENTAL REPORT EXPECTED						15. EXPECTED SUBMISSION DATE		
YES (If yes, complete EXPECTED SUBMISSION DATE)				NO X		MONTH		DAY
						YEAR		
16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)								
<p>On 3/27/03 at 1510 EST, Unit 2 was in mode 4 with the reactor shutdown for a refueling outage. Valve 2P41-F063, Unit 2 Plant Service Water Outlet from the Unit 2 Reactor Building, was found closed when its indicator showed it to be open. With valve 2P41-F063 closed PSW flow through the reactor building ECCS room coolers was isolated. The loss of the ECCS room coolers required the ECCS systems to be considered inoperable. On 3/25/03 at 0004 EST the plant entered Type B1 secondary containment. At that time, Condition D1 of TS 3.5.2 should have been entered, but because the plant operators believed that they had two OPERABLE low pressure ECCS injection/spray subsystems the Condition was not entered as required. Type B1 Secondary Containment does not include the Unit 2 Reactor Building and the required actions associated with Condition D were not met. On 3/26/03 at 1049 EST operators completed alignment of Secondary Containment to Type A. This Secondary Containment Type does include the Unit 2 Reactor Building and at this time TS 3.5.2 Required Actions D1, D2, and D3 were met.</p> <p>Plant Service Water butterfly valve 2P41-F063 was found with the spline clamp loose, allowing the actuator and indicator to turn without actually turning the butterfly valve shaft. Once the spline clamp was tightened, the actuator again was able to turn the valve shaft. The valve was placed in the correct position at 1545 on 3/27/03 restoring the required ECCS subsystems to OPERABLE status.</p>								

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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

Valve 2P41-F063, Unit 2 Plant Service Water (PSW) (EIS Code BI) outlet from the Unit 2 Reactor Building, was found closed when its indicator showed it to be open at 1510 EST on 3/27/03. This is a normally locked open valve that had been closed earlier in the outage to allow common division work on the Plant Service Water system. Following this work, operators re-opened the valve in accordance with the system restoration and verified the open indication. However, the valve had actually failed in the closed position.

The design of the PSW system at Plant Hatch is such that the PSW system is supplied to the reactor building via two separate divisions. However, the design of the PSW system's discharge from the reactor building is such that it is routed through a common header (i.e., both divisions are connected together outside the reactor building into a common line). Valve 2P41-F063 is installed in this common PSW discharge line from the reactor building. With valve 2P41-F063 in the closed position, Plant Service Water flow through all of the Emergency Core Cooling Systems (ECCS) room coolers (EIS Code VF) in the reactor building was essentially isolated. These ECCS room coolers are considered inoperable without any PSW flow through them. Although not addressed by the plant's Technical Specifications (TS), these room coolers are addressed by the plant's FSAR and Technical Requirements Manual (TRM). Unit 2 TRM Section 3.7.2 Condition D requires that with two area coolers in one or more ECCS rooms inoperable the associated system(s) be declared inoperable immediately. During this event shutdown cooling was in operation without any OPERABLE room coolers. However, the temperatures in the ECCS rooms remained below the allowable room temperatures specified in the Unit 2 FSAR. Section 9.4.2.2.3 of the Unit 2 FSAR states in part; "Under conditions requiring ECCS initiation and operation, the cooling units maintain the temperature ... less than a maximum of 145°F dry bulb in the RHR and core spray pump rooms commensurate with an outside temperature of 95°F dry bulb."

A review of the plant's TS was performed to determine if all the required actions associated with the condition of not having any ECCS systems OPERABLE were met. The Decay Heat Removal (DHR) system was in service until the cavity gates were installed at 0544 on 3/20/03. This system met the TS requirement for having alternate decay heat removal. After this time it was determined that with shutdown cooling in operation (without any room coolers) credit could still be taken for meeting the required TS actions for having an alternate method of decay heat removal available for each inoperable required RHR shutdown cooling subsystem (EIS Code BO) as well as having reactor coolant circulation by an alternate method thereby meeting the required actions associated with TS Section

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3.9.7 Conditions A and C, TS Section 3.9.8 Conditions A and C, and TS Section 3.4.8 Conditions A and B.

The only required TS action that was not complied with throughout the duration of this event was TS Section 3.5.2 Condition D. This Limiting Condition for Operation (LCO) requires two low pressure ECCS injection/spray subsystems to be OPERABLE. On 3/25/03 at 0004 EST the plant was in Mode 4 and entered Type B1 secondary containment (EIS Code NG). TS 3.5.2 for Condition D requires that without two low pressure ECCS injection/spray subsystems OPERABLE Secondary Containment must be restored. The TS Bases for 3.5.2 Condition D requires that in MODE 4 Secondary Containment must include at least the Unit 2 reactor building zone. However, because the operators were unaware that there was no flow through the southeast and northeast diagonal room coolers because the 2P41-F063 valve was in the closed position they believed that they had two OPERABLE low pressure ECCS injection/spray subsystems and did not enter the required condition. Because Type B1 Secondary Containment does not include the Unit 2 Reactor Building the required action associated with Condition D1 was not met. On 3/26/03 at 1049 EST operators completed alignment requirements and Plant Hatch was placed in Secondary Containment Type A (included Unit 2 Reactor Building). At this time TS 3.5.2 Required Actions D1, D2, and D3 were met.

As previously mentioned, valve 2P41-F063 was found closed when its indicator showed it to be open. Operations and Maintenance personnel found the spline clamp loose, allowing the actuator and indicator to turn without actually turning the butterfly valve shaft (Maintenance Work Order 20301109). Once the spline clamp was tightened, the actuator again was able to turn the valve shaft. The valve was opened at 1545 on 3/27/03. Senior Operations Department personnel witnessed the shaft turning when the actuator was moved, providing positive evidence that the problem had been corrected and the valve opened. Engineering Support personnel also witnessed flow to an ECCS room cooler increase from approximately 14 gpm to 190 gpm following repair of the spline clamp and opening of the valve. This indirectly confirms that the valve opened and supports the eyewitness account of the shaft turning as the actuator was moved. Therefore, the apparent cause has been identified and corrected and the valve has been placed and confirmed to be in its proper position.

An extent of condition review was performed. Of the safety-related Unit 2 plant service water system butterfly valves closed via clearance during the outage, only valve 2P41-F063 is configured with a spline clamp and indirect indication of its position. Personnel examined drawings for valve 2P41-F353, another safety-related plant service water valve closed during the outage, and concluded that this failure mechanism does not apply to this valve. More specifically, valve 2P41-F353 does not have a spline shaft and its position indication is coupled directly to the valve shaft. Consequently, a failure of the actuator to open the valve also would result in a failure of the position indicator to point (move) to the "open" position. Interviews with the System Operators who opened valve 2P41-F353 revealed that the position indicator moved 90 degrees to the "open" position indication as expected. Therefore, the position of valve 2P41-F353 is not in question: it is open as expected and required.

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Other butterfly valves were moved under clearances during the outage: 2P41-F312A and B; 2P41-F315A and B; 2P41-F316A-D; 2P41-F354; 2P41-F351; 2P41-F421; 2P41-F429; 2P41-F431B; and 2P41-F432B. Valves 2P41-F354, 2P41-F351, 2P41-F421, 2P41-F429, 2P41-F431B, and 2P41-F432B are non-safety related and posed no startup concerns. [They also are similar in design to valve 2P41-F353 and therefore are not vulnerable to the same failure mechanism as valve 2P41-F063.] Safety-related valves 2P41-F316A-D; 2P41-F312A and B; and 2P41-F315A and B are motor-operated valves whose position is indicated by limit switch-driven indicating lights. The limit switches are coupled directly to the valve shaft; therefore, these valves are not subject to the same failure mode as valve 2P41-F063, and their positions are not in question.

In summary, the apparent cause for this event has been identified and corrected. An extent of condition review has not identified any other suspect safety-related valves on the Unit 2 plant service water system.

CAUSE OF EVENT

Plant Service Water butterfly valve 2P41-F063 was found with the spline clamp loose, allowing the actuator and indicator to turn without actually turning the butterfly valve shaft (Maintenance Work Order 20301109). Once the spline clamp was tightened, the actuator again was able to turn the valve shaft.

The reactor building Plant Service Water System has a non-fault tolerant design by having a valve (even though it is a locked open valve) in the common discharge line that will stop flow in both divisions of Plant Service Water to the reactor building.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is required by 10 CFR 50.73(a)(2)(i)(B) because a condition existed which was prohibited by the Technical Specifications. Specifically, TS 3.5.2 for Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System establishes requirements during Mode 4 and Mode 5 (except with the spent fuel storage pool gates removed and water level  $\geq$  22 ft 1/8 inches over the top of the reactor pressure vessel flange). The Limiting Condition for Operation (LCO) requires two low pressure ECCS injection/spray subsystems to be OPERABLE. On 3/25/03 at 0004 EST the plant entered Type B1 secondary containment. At that time, Condition D1 of TS 3.5.2 should have been entered, but operators were unaware that there was no flow through the southeast and northeast diagonal room coolers because the 2P41-F063 valve was in the closed position. Because Type B1 Secondary Containment does not include the Unit 2 Reactor Building the required action associated with Condition D1 was not met. On 3/26/03 at 1049 EST operators completed alignment requirements and Plant Hatch was placed in Secondary Containment Type A (included Unit 2 Reactor Building). At this time TS 3.5.2 Required Actions D1, D2, and D3 were met.

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On 3/27/03 at 1510 EST the 2P41-F063 valve was discovered in the closed position and TS 3.4.8 Condition A, TS 3.5.2 Condition C, and TRM 3.7.2 Condition A/B/D were entered. At 1545 EST the 2P41-F063 was opened restoring PSW flow to all coolers and all the TS conditions were exited.

During this event shutdown cooling was in operation without any OPERABLE room coolers. Throughout this event the temperatures in the ECCS rooms remained below the allowable room temperatures specified in the Unit 2 FSAR. Section 9.4.2.2.3 of the Unit 2 FSAR states in part; "Under conditions requiring ECCS initiation and operation, the cooling units maintain the temperature ... less than a maximum of 145°F dry bulb in the RHR and core spray pump rooms commensurate with an outside temperature of 95°F dry bulb."

Based on the above information, it is concluded that this event had no adverse impact on nuclear safety because the ECCS pump rooms remained within the design temperatures with the required shutdown cooling systems in service.

CORRECTIVE ACTIONS

Plant Service Water butterfly valve 2P41-F063 was repaired by tightening the spline clamp that secured the actuator to the valve shaft. Once the spline clamp was tightened, the actuator again was able to turn the valve shaft. The valve was placed in the correct position restoring the required ECCS subsystems to OPERABLE.

Valves 2P41-F063 and 1P41-F063 will be removed from the reactor building common discharge lines during the next respective Unit 2 and Unit 1 refueling outages.

ADDITIONAL INFORMATION

No systems other than those previously described in this report were affected by this event.

## Failed Component Information:

Master Parts List: 2P41-F063

Manufacturer: Masoneilan

Manufacturer Code: M120

Model Number: 2037020

Type: 10 inch 150 LB Butterfly Valve

EHS System Code: BI

EHS Component Code: ISV

Root Cause Code: X

Reportable to NPRDS: Yes