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**SEP 03 2015**

Docket Nos.: 50-321

NL-15-1642

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

Edwin I. Hatch Nuclear Plant Unit 1  
Licensee Event Report 2015-002-00  
1A Plant Service Water Pump Misalignment Results in a Condition Prohibited by  
Tech Specs

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i)(B), Southern Nuclear Operating Company hereby submits the enclosed Licensee Event Report.

This letter contains no NRC commitments. If you have any questions, please contact Greg Johnson at (912) 537-5874.

Respectfully submitted,

C. R. Pierce  
Regulatory Affairs Director

CRP/jcm

Enclosure: LER 2015-002-00

U. S. Nuclear Regulatory Commission

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cc: Southern Nuclear Operating Company

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U. S. Nuclear Regulatory Commission

Mr. V. M. McCree, Regional Administrator

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Mr. D. H. Hardage, Senior Resident Inspector – Hatch

**Edwin I. Hatch Nuclear Plant Unit 1**  
**1A Plant Service Water Pump Misalignment Results in a Condition**  
**Prohibited by Tech Specs**

**Licensee Event Report 2015-002-00**

**1A Plant Service Water Pump Misalignment Results in a Condition**  
**Prohibited by Tech Specs**



**LICENSEE EVENT REPORT (LER)**

Estimated burden per response to comply with this mandatory 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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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 an 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.

<b>1. FACILITY NAME</b> Edwin I. Hatch Nuclear Plant Unit 1	<b>2. DOCKET NUMBER</b> 05000 321	<b>3. PAGE</b> 1 OF 3
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**4. TITLE**  
1A Plant Service Water Pump Misalignment Results in a Condition Prohibited by Tech Specs

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
01	20	2015	2015	- 002	- 00	9	3	2015	FACILITY NAME	DOCKET NUMBER

<b>9. OPERATING MODE</b>	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>			
2	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
10. POWER LEVEL  007	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

LICENSEE CONTACT Edwin I. Hatch / Carl Collins – Licensing Supervisor	TELEPHONE NUMBER (Include Area Code) 912-537-2342
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**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
B	BI	P	S450	Y					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b>	MONTH	DAY	YEAR

**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On January 20, 2015 it was observed that the 1A Plant Service Water (PSW) Pump was exhibiting unusually high vibrations. The 1A PSW pump was declared inoperable and the 1C PSW pump was placed in service. The cause of the 1A PSW pump high vibrations was due to pump shaft misalignment as a result of inadequate procedural guidance. It was identified that during a work order that rebuilt and replaced the 1A PSW pump in 2010, the seismic restraints were installed offset from the centerline of the pump. The pump column therefore had to be pressed and bridged over in order to appropriately fit the restraints. In this configuration, considerable loads were applied to both the upper and lower restraints causing the supports to eventually break.

It was determined that the 1A PSW pump would not have been able to meet its 30 day mission time based on the broken seismic restraints and the excessive vibration levels found on the pump. If a design basis seismic event would have occurred such that the seismic restraints on the pump would have broken, this would have left the 1A PSW pump unsupported. The pump would therefore not have been able to operate at these elevated vibrations for more than 24 hours. The 1A PSW pump was replaced and maintenance procedures were revised to ensure that the restraints are maintained in the proper configuration whenever future maintenance is performed.



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

Estimated burden per response to comply with this mandatory 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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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 an 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.

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**NARRATIVE**

PLANT AND SYSTEM IDENTIFICATION

General Electric – Boiling Water Reactor  
Energy Industry Identification System codes appear in the text as (EIIS Code XX)

DESCRIPTION OF EVENT

On January 20, 2015 at 2304 with Unit 1 at approximately 7 percent thermal power due to a scheduled outage for SRV maintenance, it was observed that the 1A Plant Service Water (PSW) pump (EIIS Code P) was exhibiting unusually high vibrations. Vibration readings were taken at the upper and lower motor bearing areas on the pump. The data compared to reference data showed a significant change from normal vibration levels. Additionally, vibration data was taken along the pump suction column in the area near the upper and lower seismic restraints. The 1A PSW pump was declared inoperable and the 1C PSW pump was placed in service.

On January 22, 2015 at 1515 the upper restraint strap was found broken and the strap bolt was galled on the west side. Two bolts of the lower restraint strap were also found sheared. It was determined that the restraints were weakened over time due to fatigue from the vibrating pump. Therefore, when the restraints broke, the pump began to exhibit unusually high vibrations.

On January 26, 2015 at 0245 with Unit 1 at approximately 100 percent thermal power, the 1A PSW pump was replaced. The pump was then declared operable and returned to service.

On July 8, 2015, in consultation with the pump vendor and engineering, it was determined that the 1A PSW pump would not have been able to meet its 30 day mission time based on the broken seismic restraints and the excessive vibration levels found on January 20, 2015. Although the pump accumulated 30,000 hours of run time prior to being declared inoperable on January 20, 2015, if a seismic event would have occurred such that the seismic restraints on the pump would have broken, this would have left the 1A PSW pump unsupported. It was then concluded that the pump would have not been able to operate at elevated vibrations for more than 24 hours. This assessment is based in the amount of wear that was found on the shaft after the pump was disassembled. Shaft degradation indicated that with continued operation after 24 hours, the pump would not have been able to meet rated flow and pressure.

CAUSE OF EVENT

The cause of the 1A PSW pump high vibrations was due to pump shaft misalignment as a result of inadequate procedural guidance. It was identified that the 1A PSW pump seismic restraints were installed offset from the centerline of the pump. The upper restraint was installed 1/4 inch offset to the east, while the lower restraint was installed 3/4 inch offset to the west and a 5/8 inch offset that extended from the wall. These seismic restraints were installed in 2010. The pump column had to be pressed and bridged over in order to appropriately fit in the restraints. In this configuration, considerable loads were applied to both the upper and lower restraints and the pump shaft. The upper and lower supports eventually failed due to the applied stress resulting in the unusually high vibrations seen from the 1A PSW pump.

REPORTABILITY AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73(a)(2)(i)(B) due to being in a condition prohibited by Technical Specifications. As a result of the misalignment of the seismic restraints, it was determined that if a design basis seismic event would have occurred, the 1A PSW pump would not have been able to meet its 30 day mission

**LICENSEE EVENT REPORT (LER)  
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time. This conclusion is based on the elevated vibrations found on the pump after the failure of the seismic restraints.

The plant service water system is designed to provide screened cooling water to the plant during normal operation and shutdown conditions. Each system consists of four, one-third capacity service water pumps. Each pump is capable of delivering their rated capacity of 8500 gallons per minute. In the event of a shutdown or emergency shutdown, only one PSW pump delivering 4428 gallons per minute is required. Therefore, the loss of one PSW pump does not pose a significant impact to provide reliable cooling to equipment required for accident conditions. Based on this information, this condition was determined to have very low safety significance.

CORRECTIVE ACTIONS

The 1A PSW pump was refurbished and replaced. The misaligned pump seismic restraints were also corrected and set in an appropriate configuration. The plant service water pump and motor disassembly, inspection, and re-assembly procedure was also revised to ensure that the restraints are maintained in the proper configuration if maintenance is performed that replaces or adjusts the pump saddle restraints. Preventive maintenance work orders were also modified to obtain monthly measurements of the vibration levels near the pump seismic restraints should high vibrations be encountered at the motor.

As part of the extent of condition review, all of the seismic restraints on the remaining 7 PSW pumps were inspected and found to be in their proper alignment. The 1A PSW pump was the only pump found to have increased vibration levels.

ADDITIONAL INFORMATION

Other Systems Affected: None.

Failed Components Information:

Master Parts List Number: 1P41C001A  
 Manufacturer: Sulzer  
 Model Number: GC-2751/54  
 Type: 24EC 3 Stage Vertical Pump  
 Manufacturer Code: S450

EIIS System Code: BI  
 Reportable to EPIX: Y  
 Root Cause Code: B  
 EIIS Component Code: P

Commitment Information: This report does not created any new licensing commitments.

Previous Similar Events: None.