Nuclear Operating Company

South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

January 31, 2007
NOC-AE-07002105
File No.: G25
10 CFR 50.73

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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South Texas Project
Unit 2
Docket No. STN 50-499
Licensee Event Report 2-06-001
Safety Injection Train Inoperable Longer Than Allowed Under Technical Specifications

Pursuant to 10 CFR 50.73, the STP Nuclear Operating Company (STPNOC) submits the attached Unit 2 Licensee Event Report 2-06-001 to address an incident of failure to restore safety injection Train A to service in the time required by Technical Specifications.

High head safety injection pump 2A was declared inoperable at 0100 on November 27, 2006, due to maintenance requirements; this also made the associated low head safety injection and containment spray pumps inoperable. The allowed outage time expired at 0100 on December 4, 2006. Because the time for repairs was expected to exceed that time, STPNOC requested Enforcement Discretion from the Technical Specification requirements to allow operation for an additional eight days beyond the allowed outage time. The request was granted by the NRC. The HHSI pump and the associated components were declared operable at 1119 on December 7, 2006. This event did not have an adverse effect on the health and safety of the public.

There are no commitments contained in this Licensee Event Report. Corrective actions will be processed in accordance with the STP Corrective Action Program.

If there are any questions on this submittal, please contact either P. L. Walker at (361) 972-8392 or me at (361) 972-8902.

Ken L. Coates
Plant Manager

PLW
Attachment: LER 2-06-001, Safety Injection Train Inoperable Longer Than Allowed Under Technical Specifications

LER 2-06-001.doc STI: 32105478 IE22

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NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

I. APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

Estimated burden per response to comply with this mandatory information collection request: 50 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

LICENSEE EVENT REPORT (LER)

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

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4. TITLE

Safety Injection Train Inoperable Longer Than Allowed Under Technical Specifications

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									N/A	
12	04	2006	2006	- 001 -	00	01	31	2007	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	1
10. POWER LEVEL	100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR ': (Check all that apply)

	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©(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)
	20.2203(a)(2)(i)		50.36©(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
	20.2203(a)(2)(ii)		50.36©(2)	50.73(a)(2)(v)(B)	OTHER – None
	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	TELEPHONE NUMBER (Include Area Code)
Philip L. Walker, Staff Licensing Engineer	361-972-8392

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	BQ	P	P025	X					

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE)		NO		05	01	2007

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

On November 27, 2006, Unit 2 High Head Safety Injection (HHSI) pump 2A of the Emergency Core Cooling System (ECCS) was declared inoperable at 0100 due to maintenance requirements; this also made the associated low head safety injection and containment spray pumps inoperable. During disassembly, internal damage to the pump occurred, requiring repairs before the HHSI pump could be returned to operability. The allowed outage time expired at 0100 on December 4, 2006. Because the repairs were expected to exceed that time, Enforcement Discretion was approved by the NRC on December 3, 2006, allowing operation for an additional eight days.

Technical Specifications 3.5.2 and 3.6.2.1 require that if one train of ECCS and containment spray is inoperable, it is to be restored to operability within seven days or the unit is to be in at least hot standby within six hours. The HHSI pump and the associated components were declared operable at 1119 on December 7, 2006. Because these components were inoperable longer than allowed under the Technical Specifications without entering the appropriate action statements, this event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

The root cause is that the unexpected condition was not sufficiently assessed and the potential hazards to the affected components were not identified prior to proceeding to use force in removing the pump half-coupling. For corrective action, affected personnel will be retrained on the Conduct of Maintenance and expectations on tool use. The Rotating Equipment Certifications of the craftsmen involved have been deactivated, pending remedial training and recertification. In addition, a contributing factor of a pre-existing condition involving assembly of the pump rotating element was identified. This aspect is currently under review.

Only Train A of Unit 2 was affected. This event resulted in no personnel injuries, no offsite radiological releases, and no damage to other safety-related equipment.

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

I. DESCRIPTION OF EVENT

A. REPORTABLE EVENT CLASSIFICATION

This event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B). Technical Specifications 3.5.2 and 3.6.2.1 require that three trains of ECCS and containment spray be operable. However, an ECCS train and a containment spray train were inoperable longer than the allowed outage time and plant shutdown was not accomplished within the required time. Consequently, STP Unit 2 was in a condition prohibited by Technical Specifications.

B. PLANT OPERATING CONDITIONS PRIOR TO EVENT

STP Unit 2 was in Mode 1 at 100% power.

C. STATUS OF STRUCTURES, SYSTEMS, AND COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

No other inoperable structures, systems, or components contributed to the event.

D. NARRATIVE SUMMARY OF THE EVENT

At 0100 on November 27, 2006, Unit 2 High Head Safety Injection (HHSI) pump 2A of the Emergency Core Cooling System (ECCS) was declared inoperable to perform planned maintenance activities to replace the mechanical seal. This also made the associated Low Head Safety Injection (LHSI) and Containment Spray (CS) systems inoperable.

Access to the mechanical seal required removal of a pump half-coupling. However, the half-coupling was found to be stuck. To free the stuck half-coupling, use of hydraulic force was determined to be necessary. The force exerted in freeing the half-coupling apparently damaged the pump internals. The mechanical seal package was replaced and, during reassembly, a spacer connecting the half-coupling could not be reinstalled due to a lack of clearance. The pump casing was filled with water to check the pump shaft for freedom of rotation. However, the pump shaft would not rotate, with the following as probable causes:

- Internal obstruction resulting from application of excessive force to remove the half-coupling.
- Internal obstructions resulting from repeated vertical movement of the pump shaft without lubrication to the upper impeller bearings during reassembly, causing galling of the stainless steel bearings.

Consequently, the decision was made to overhaul the pump, including replacement of the rotating element. Actions to restore the pump to operability were expected to require an additional six days beyond the seven-day allowed outage time that expired at 0100 on December 4, 2006. Because this was a first-time evolution for the South Texas Project, Enforcement Discretion was requested from the NRC and was verbally approved by the NRC on December 3, 2006, allowing an additional eight days of operation to complete restoration of the pump.

Operability of the other two Unit 2 HHSI pumps, Train B and Train C, was confirmed by satisfactory test results on December 2, 2006.

The rotating element was shipped to the vendor for disassembly, failure analysis, and

refurbishment. Using a replacement rotating element, there continued to be insufficient clearance available to reinstall the spacer. The dimensions of the motor stand, pump shaft, and motor shaft were measured; all dimensions were found to be within the allowed tolerances. However, the combination of multiple deviations from nominal dimensions was sufficient to restrict spacer installation. Machining of selected components enabled the spacer to be installed.

After reassembly, post-maintenance testing was completed satisfactorily, and the HHSI pump and associated components were declared operable at 1119 on December 7, 2006.

E. METHOD OF DISCOVERY OF EACH COMPONENT FAILURE, SYSTEM FAILURE, OR PROCEDURAL ERROR

This condition was identified during planned maintenance on the HHSI pump of Unit 2 Train A.

II. EVENT-DRIVEN INFORMATION

A. SAFETY SYSTEMS THAT RESPONDED

No safety systems were required to respond during this event.

B. DURATION OF SAFETY SYSTEM INOPERABILITY

The Train A HHSI, LHSI, and CS pumps were declared inoperable at 0100 on November 27, 2006. The allowed outage time of seven days permitted the affected train to be inoperable until 0100 on December 4, 2006. Repairs to the HHSI pump were completed and Train A was declared operable at 1119 on December 7, 2006. The train was inoperable for ten days, ten hours.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

Technical Specification Requirements:

Technical Specification 3.5.2 requires that three trains of the Emergency Core Cooling System (ECCS) be operable in Modes 1 through 3. With less than this operable, but with at least two HHSI pumps operable, two LHSI pumps and associated Residual Heat Removal (RHR) heat exchangers operable, and sufficient flow paths to accommodate them, the inoperable train is to be restored to operable status within seven days. If not accomplished, the unit is to be in at least hot standby within the next six hours and in hot shutdown within the following six hours.

Technical Specification 3.6.2.1 requires that three independent trains Containment Spray (CS) be operable in Modes 1 through 4. With one CS train inoperable, the inoperable train is to be restored to operable status within seven days or be in at least hot standby within the next six hours. If not restored to operability within the next 48 hours, the unit is to be in cold shutdown within the following 30 hours.

Because these components were inoperable longer than allowed under the Technical Specifications without entering the appropriate action statements, this event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

Design Description:

The Train A LHSI pump and the Train A CS pump share a common suction header with the Train A HHSI pump. With this line out of service to support HHSI maintenance, the LHSI and

CS pumps are also inoperable. Only Train A of the Unit 2 ECCS and CS systems was affected.

Equipment History:

STPNOC reviewed data covering the preceding three years of inservice test performance, vibration monitoring, motor and pump predictive maintenance, and motor current trends, as well as open work requests associated with the affected pumps. No adverse trends were identified that would have indicated the found condition of the Train A HHSI pump.

Risk Assessment:

The pump was non-functional until December 7, 2006, at 0400, and declared operable on December 7, 2006, at 1119. STPNOC assessed the Unit 2 incremental core damage and large early release probabilities associated with the actual time as a result of continuing to operate while the Train A HHSI was non-functional beyond the allowed outage time. The resulting risk values are as follows:

	ICCDP*	ICLERP**
Projected Change for Additional 8 Days	4.44E-07	7.57E-11
Actual Change for Additional 75 Hours	1.7E-07	3.0E-11
Allowable Change (Part 9900)	< 5.0E-07	< 5.0E-08

* Incremental Conditional Core Damage Probability

** Incremental Conditional Large Early Release Probability

The calculated changes in probabilities demonstrate that the extended period of inoperability had a very small impact on plant risk.

This event resulted in no personnel injuries, no offsite radiological releases, and no damage to other safety-related equipment. The extension was not risk significant and did not result in a net increase in the radiological risk to the public.

III. CAUSE OF THE EVENT

The unexpected condition of the stuck half-coupling was not sufficiently assessed and the potential hazards to the affected components were not identified prior to proceeding to use force in removing the pump half-coupling.

Review by the vendor of the disassembled rotating element found evidence of a pre-existing material condition that may be contributing factor to the pump's adverse condition. This aspect of the event is under review and will be addressed in a supplement to this report.

IV. CORRECTIVE ACTIONS

Affected personnel will be retrained on the Conduct of Maintenance and expectations on tool use.

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

The Rotating Equipment Certifications of the craftsmen involved have been deactivated, pending remedial training and recertification.

A supplemental report will be submitted to the NRC providing the findings from review of the as-found condition of the rotating element.

V. PREVIOUS SIMILAR EVENTS

STPNOC reviewed the work history for mechanical seal replacement on Unit 1 and Unit 2 HHSI pumps and identified no previous adverse experiences. The work history for mechanical seal replacement in LHSI and CS pumps was also reviewed. There had been only one previous instance of a pump half-coupling stuck in an LHSI pump. This was resolved by removing the motor and removal of the half-coupling using a puller.

VI. ADDITIONAL INFORMATION

None.

[redacted]