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

November 3, 2003
NOC-AE-03001625
10CFR50.73

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

South Texas Project
Unit 1
Docket No. STN 50-498
Licensee Event Report 1-03-005
Auxiliary Feedwater Pump 11 Breaker Failure to Close

Pursuant to 10CFR50.73, the South Texas Project submits the attached Unit 1 Licensee Event Report 1-03-005 regarding Auxiliary Feedwater Pump 11 Breaker failure to close for Unit 1. This event did not have an adverse effect on the health and safety of the public.
There are no commitments contained in this event report. Resulting corrective actions will be handled in accordance with STP Corrective Action Program.
If there are any questions on this submittal, please contact S. M. Head at (361) 972-7136 or me at (361) 972-7849.

E. D. Halpin
Plant General Manager

Jal/wrb
Attachment: LER 1-03-005 (South Texas, Unit 1)

IE22

LER 1-03-005.doc

STI: 31665708

cc:
(paper copy)

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

LICENSEE EVENT REPORT (LER)

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

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 conduct or sponsor, and a

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4. TITLE

Auxiliary Feedwater Pump 11 Breaker Failure to Close

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
09	04	2003	2003	- 05 -	00	11	03	2003		05000
									FACILITY NAME	DOCKET NUMBER 05000

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
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)
William B. Bealefield, Jr.	361-972-7696

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
X	AF	BKR	ABB	YES					

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

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

On September 4, 2003, Unit 1 was operating at 100% power when a routine surveillance test run of Auxiliary Feedwater Pump (AFWP) 11 was attempted. When operators attempted to start the pump, the supply breaker failed to close. The pump had been successfully run twice since the breaker was overhauled in June 2003. After the breaker was replaced with a spare, the surveillance was completed satisfactorily.

The cause of the failure was determined to be increased mechanical resistance of the breaker mechanism caused by a random build up of tolerances from wear and case distortion which our existing overhaul program did not identify, coupled with a significant reduction in latch spring rotational torque capability (6 turn spring).

It was determined that AFWP 11 was out of service while Standby Diesel Generator (SDG) 13 was out of service on August 18 and 19, 2003, in violation of Technical Specification 3.8.1.1, Action D.

This event resulted in no personnel injuries, no offsite radiological releases, and no damage to safety-related equipment. There were no challenges to plant safety.

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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 10CFR50.73(a)(2)(i)(B), violation of Technical Specification 3.8.1.1, Action D.

B. PLANT OPERATING CONDITIONS PRIOR TO EVENT

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

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

It was determined that AFWP #11 was Out of Service while Standby Diesel Generator 13 was Out of Service on August 18 and 19, 2003 in violation of Technical Specification 3.8.1.1, Action D.

D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROXIMATE TIMES

On September 4, 2003, Unit 1 was operating at 100% power when a routine surveillance test run of AFW Pump 11 was started at approximately 1355. When operators attempted to start the pump, the supply breaker failed to close. When the breaker was inspected locally, it was found that the closing springs were not charged. The breaker was replaced with a spare and the surveillance was completed successfully.

Shop inspection of the breaker found that the spring charging motor was burned up. The only visual clue was the trip latch return spring (6-turn) was different than the one removed (5 turn) as part of a recent overhaul. Preliminary investigation found that the weaker (6-turn) spring did not always reset the trip latch assembly. As a result, the operating mechanism cam continued to rotate and cycle the spring charging motor ON and OFF until the motor overheated and failed.

Investigation by the vendor (ABB) determined that the 6-turn spring was correct per the original design drawings. The stronger 5-turn spring was introduced in 1992. ABB has been unable to determine the reason the 5-turn spring came into use. A check of the parts bin at ABB found both 5 and 6 turn springs available.

The cause is a build up of tolerances that increased mechanical resistance in the breaker mechanism coupled with installation of the significantly weaker 6-turn spring. The stronger 5-turn spring was able to overcome the higher resistance, while the 6-turn spring could not.

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

This condition was identified during a routine surveillance test run of AFW Pump 11.

II. EVENT DRIVEN INFORMATION

A. SAFETY SYSTEMS THAT RESPONDED

Not Applicable.

B. DURATION OF SAFETY SYSTEM INOPERABILITY

The initial failure of the AFWP 11 breaker occurred on August 3, 2003 following a surveillance when the pump was secured and the breaker opened. When the breaker was closed earlier on August 3, the closing springs charged and latched, but the charging motor cycled on and off repeatedly, then overheated and failed. Subsequently on August 8, 2003, AFWP 11 was started and passed its surveillance, however the breaker at this time was unable to recharge the closing springs due to the failed charging motor. During the surveillance on September 4, 2003 it was found that AFWP 11 would not start due to the closing springs not being charged. Duration approximately 31 days.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

This event is categorized as low risk significance by PRA. The STP PRA results based on the Zero Maintenance Model MAS_1999 showed that the incremental change in core damage probability due to unplanned maintenance of AFW Pump 11 is 2.1 E-8. This is based on the failure of the AFW Pump 11 breaker being a unique event and therefore analyzed from the time of discovery to the time of repair.

III. CAUSE OF THE EVENT

The cause of the failure was determined to be increased mechanical resistance of the breaker mechanism caused by a random build up of tolerances from wear and case distortion which our existing overhaul program did not identify, coupled with a significant reduction in latch spring rotational torque capability (6 turn spring).

In working with ABB on the root cause investigation, several differences were found between the STP 5HK and the ABB overhaul program. The most significant difference is the level of detailed inspection of individual parts of the mechanism following disassembly. The STP program relies on refurbishment using a standard overhaul parts kit. Other parts are inspected and replaced only when obvious damage is found. The ABB program inspects all parts to a very high level of detail.

IV. CORRECTIVE ACTIONS

A. Remove 6 turn springs from STP stock and restock with 5 turn springs.

B. Changed the procurement description of the ABB refurbishment kit to specify 5 turn springs.

C. Replaced the breaker with the failed charging spring motor with a spare breaker and completed the AFW 11 surveillance satisfactorily.

D. Upgrade the STP 5HK breaker overhaul program to incorporate improvements identified during the ABB investigation.

E. Inspect other ABB breakers overhauled within the past 12 months to determine if 5 turn or 6 turn springs are installed.

V. PREVIOUS SIMILAR EVENTS

A. One possible similar failure was reported by Duke Power. Unfortunately, no root cause was performed and the mechanism was discarded. As such we could not confirm if the two events were related.

B. On 10/23/03 Limerick station contacted STP Electrical Maintenance personnel to report a mechanism failure following refurbishment where the spring charging motor continuously cycled. The failure was found prior to installation in the plant as part of the post maintenance bench testing of the breaker.

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

VI. ADDITIONAL INFORMATION

STP has no operating experience with a similar failure.