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

May 8, 2003
NOC-AE-03001517
10CFR50.73
STI 31591084

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

South Texas Project
Unit 2
Docket No. STN 50-499
Licensee Event Report 03-002
Automatic Safety Injection Actuation

Pursuant to 10CFR50.73, South Texas Project submits the attached Unit 2 Licensee Event Report 03-002 regarding an automatic safety injection actuation that occurred on March 9, 2003. This event did not have an adverse effect on the health and safety of the public.

Corrective actions 2, 3, and 4 are the only commitments in this event report.

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
by R. L. Coates

E. D. Halpin
Plant General Manager

rdp

Attachment: LER 03-002 (South Texas, Unit 2)

IE22

cc:
(paper copy)

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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 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 person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
South Texas Unit 2	05000 499	1 OF 4

4. TITLE
Safety Injection Actuation

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
03	09	2003	2003	- 02 -	00	05	08	2003	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE	3
10. POWER LEVEL	0

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(c)(1)(i)(A)	X	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)		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)
Robyn D. Piggott	361-972-7438

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

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

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

On March 09, 2003, Unit 2 was stable in Mode 3. Operators were transferring reactor coolant system temperature control from Main Steam (MS) Power Operated Relief Valve (PORV) 2C to MS PORV 2B when an unexpected MS Low Compensated Pressure Safety Injection actuation signal was initiated.

The safety injection signal was generated when Low Compensated Steam Pressure signals were received on all three channels of Steam Generator 2B due to anticipatory gain as a result of dynamic pressure oscillations in the 2B Main Steam line. The pressure oscillations occurred due to condensed water in the MS line and PORV stack. The root cause was that STP elected to operate the plant in a non-routine configuration without properly assessing the plant conditions and consequences that it created. Corrective actions include procedure and program enhancements.

This event resulted in no personnel injuries, offsite radiological releases, or damage to safety related equipment. There were no challenges to plant safety and the plant responded as expected.

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

DESCRIPTION OF EVENT

On March 09, 2003, Unit 2 was stable in Mode 3 with the reactor coolant system at normal operating pressure and temperature. Pressurizer pressure was being controlled in manual. The secondary plant was still in cold shutdown conditions, with the main condenser isolated due to ongoing repairs on the turbine. All Main Steam (MS) Isolation Valves, MS Isolation Bypass Valves, and, MS Isolation Valve above seat drain valves were closed. MS Power Operated Relief Valve (PORV) 2C had been in service for temperature control for approximately 3-1/2 days. At 2041 hours, operators closed MS PORV 2C to transfer reactor coolant system (RCS) temperature control from MS PORV 2C to MS PORV 2B. MS PORV 2B was opened approximately 5 %. The expected decrease in RCS temperature was not observed so MS PORV 2B was opened to approximately 10 % to match the previous MS PORV 2C demand. At 2047 hours, a Steam Flow/Feed Flow Mismatch alarm on Steam Generator (SG) 2B was received followed by an automatic safety injection signal from 2B Low Compensated MS Line Pressure.

All engineered safety features (ESF) systems actuated as designed. The minimum RCS pressure reached was approximately 2200 psig, greater than the shutoff head of the safety injection (SI) pumps, so no injection into the RCS occurred as a result of the actuation.

At approximately 2109 hours, operators were transitioning to terminate the safety injection event when the reactor coolant system pressurizer PORV 0655A opened due to the integration function of the Pressurizer Master Controller in response to a pressurizer pressure of approximately 2270 psig. As a result of the SI, a phase A containment isolation actuation occurred which resulted in the isolation of instrument air. The pressurizer spray valves closed due to loss of instrument air and the pressurizer heaters remained operating in manual causing reactor coolant system pressure to increase. Instrument air was restored to the containment allowing the pressurizer spray valves to be opened and the reactor coolant system pressure to be stabilized.

An investigation into this event revealed that the horizontal run of pipe near MS PORV 2B and some of the vertical piping between the MS PORV and the SG outlet contained condensation that had settled in the MS line during the 3 days that MS PORV 2C had been in operation for temperature control. Since the MS isolation valve above seat drain valves had to remain closed due to the condenser not being available, the steam in "non-steaming" MS lines condensed and collected in the lines. When PORV 2B was initially opened at 2041 hours, no significant change was seen in the RCS temperature because the PORV was discharging water instead of steam. A Plant Operator noted a significant amount of water running off of the Isolation Valve Cubicle building roof at the 55' level after PORV 2B was opened and observed water bubbling out of the PORV 2B discharge stack.

EVENT SIGNIFICANCE

This event resulted in no personnel injuries, radiation exposure, offsite radiological releases or damage to important safety related equipment. The event is reportable pursuant to 10CFR50.73(a)(2)(iv)(A) because it resulted in a condition that resulted in manual or automatic actuation of emergency core cooling systems.

The risk associated with Mode 3 operations is conservatively performed by using the Mode 1 PRA and eliminating certain initiating events that do not impact Mode 3 operations. In the case of an inadvertent safety injection actuation the PRA model processes this initiating event as a reactor trip. This initiator is

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

not valid in Mode 3 due to plant conditions therefore there is no impact to plant risk.

CAUSE OF EVENT

The safety injection signal was generated when Low Compensated Steam Pressure signals were received on all three channels of Steam Generator 2B due to anticipatory gain as a result of dynamic pressure oscillations in the 2B Main Steam line. The pressure oscillations occurred due to phase changes as steam pushed past condensed water in the Main Steam line and PORV stack. The root cause was that STP elected to operate the plant in a non-routine configuration without properly assessing the plant conditions and consequences that it created.

CORRECTIVE ACTIONS

1. All steam lines upstream of the Main Steam isolation valves were drained as part of the secondary startup once the condenser was available.
2. Plant operating procedure, 0POP03-ZG-0001, Plant Heat-up, has been revised to add guidelines for monitoring and draining the MS lines, if appropriate. The revision includes several cautions to the operator that draining condensation in Main Steam lines may be necessary.
3. STP will develop and implement a formal process for timely identification of planned infrequent/non-routine plant configurations; for assessing the possible plant conditions and consequences that could be created by these plant configurations; and for specifying any required compensatory actions. This action will be completed by July 31, 2003. In the interim, the Unit 1 forced outage approved work schedule and plant configuration is being reviewed and approved by the Shutdown Risk Assessment Group using proceduralized criteria. The Unit 1 Operations Manager leads the Shutdown Risk Assessment review. The Unit Operations Manager with the input of appropriate key stakeholders reviews specific conditions that require additional consideration on Unit 2.
4. STP will add precautions or instructions to appropriate plant procedures to ensure it is recognized that condensation can build up in the Main Steam lines if the condenser is not available and there is no draining or blowdown of the line. These procedures will be identified and revised by July 31, 2003.

ADDITIONAL INFORMATION

Consideration will be given to developing a modification that will allow the Main Steam lines upstream of the Main Steam isolation valves to be drained when the condenser is not available.

MS PORV Operability:

STP concluded that the MS PORVs remained operable during and following this event. The PORV manufacturer, CCI (Control Components International), was consulted and concurred that these valves would pass water with no adverse affects.

When this event occurred, a significant amount of water vented through the MS PORV 2B upon actuation. MS PORV 2B behaved normally during the water venting and then proceeded to vent steam. This function of venting steam, for startup purposes, is not an automatic function, but at the discretion of the plant operator. This function is therefore not time sensitive in that PORV initiation

is not required to take place within seconds. The need for PORV initiation during the initial heat-up or to switch to another train is a long-term evolution therefore it is a manual operation.

Because PORV initiation is a manual function and not time sensitive, the time to vent condensation from the Main Steam line does not interfere with the ability of the MS PORV to perform its design function to vent steam and control RCS pressure/temperature. The water collection issue is therefore not an operability issue because the PORV is capable of performing its design function.

STP also considered the operability of the MS safety valves and it was concluded that they remained operable. The Technical Specification Limiting Condition for Operation 3/4.7.1.1 Action (a) that applies to the MS safety valves is only applicable if all four reactor coolant loops are in operation. Only two loops were initially in operation and the water had been drained from the MS lines prior to putting all four reactor coolant loops in operation.

Pressurizer PORV lift:

Since the start of 2003, there have been four events resulting in the lifting of pressurizer PORVs in Unit 1 and Unit 2. Although none of these events proved consequential in terms of actual impact to nuclear safety, these events have challenged nuclear safety barriers. These events were looked at for common causes due to this adverse trend.

As a result, STP identified that operator knowledge regarding the pressurizer pressure master controller was deficient. Licensed operators received training on the pressurizer pressure control system. Corrective actions planned include formal training to all licensed operators on the operational characteristics of the pressurizer pressure control system. The training will include the lessons learned from these events. The lessons learned will also be included in the appropriate lesson plans for initial Licensed Operator Training.