



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

February 28, 2013  
NOC-AE-13002974  
File No.: G25  
10 CFR 50.73  
STI: 33661623

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555-0001

South Texas Project  
Unit 2  
Docket No. STN 50-499  
Licensee Event Report 2-2013-001  
Unit 2 Manual Reactor Trip Due to Dropped Rods M8 and D8

Pursuant to 10 CFR 50.73, STP Nuclear Operating Company (STPNOC) submits the attached Unit 2 Licensee Event Report (LER) 2-2013-001 to address the Unit 2 Manual Reactor trip that occurred on January 4, 2013.

This condition is considered reportable under 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section.

This event did not have an adverse effect on the health and safety of the public.

There are no commitments contained in this LER. Corrective actions will be implemented in accordance with the STP Corrective Action Program.

If there are any questions on this submittal, please contact either Jamie Paul at (361) 972-7344 or me at (361) 972-7800.

A handwritten signature in black ink, appearing to read "Dennis L. Koehl".

Dennis L. Koehl  
President and CEO/CNO

JLP

Attachment: LER 2-2013-001

IE22  
MR

cc:  
(paper copy)

Regional Administrator, Region IV  
U. S. Nuclear Regulatory Commission  
1600 East Lamar Blvd  
Arlington, Texas 76011-4511

Balwant K. Singal  
Senior Project Manager  
U.S. Nuclear Regulatory Commission  
One White Flint North (MS 8B1)  
11555 Rockville Pike  
Rockville, MD 20852

Senior Resident Inspector  
U. S. Nuclear Regulatory Commission  
P. O. Box 289, Mail Code: MN116  
Wadsworth, TX 77483

C. M. Canady  
City of Austin  
Electric Utility Department  
721 Barton Springs Road  
Austin, TX 78704

(electronic copy)

A. H. Gutterman, Esquire  
Morgan, Lewis & Bockius LLP

Peter Nemeth  
Crain Caton & James, P.C.

John Ragan  
Chris O'Hara  
Jim von Suskil  
NRG South Texas LP

Kevin Pollo  
Richard Pena  
City Public Service

C. Mele  
City of Austin

Richard A. Ratliff  
Texas Department of State Health  
Services

Alice Rogers  
Texas Department of State Health  
Services

Balwant K. Singal  
U. S. Nuclear Regulatory Commission

NRC FORM 366 (10-2010)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104 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 Section (T-5 F53). U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to <a href="mailto:Infocollects.resource@nrc.gov">Infocollects.resource@nrc.gov</a> , and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202. (3150-1104), 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>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)					EXPIRES: 10/31/2013					
1. FACILITY NAME South Texas Unit 2					2. DOCKET NUMBER 05000499			3. PAGE 1 OF 4		
4. TITLE Unit 2 Manual Reactor Trip Due to Dropped Rods M8 and D8										
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	04	2013	2013	001	0	02	28	2013	N/A	N/A
9. OPERATING MODE			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR§: (Check all that apply)							
1   10. POWER LEVEL 100%			<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) <input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input checked="" 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 type="checkbox"/> 50.73(a)(2)(i)(B) <input type="checkbox"/> 50.73(a)(2)(v)(D) <small>Specify in Abstract below or in NRC Form 366A</small>							
12. LICENSEE CONTACT FOR THIS LER										
FACILITY NAME Jamie Paul, Licensing Supervisor								TELEPHONE NUMBER (Include Area Code) 361-972-7344		
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	
X	AA	HS	G223	Y						
14. SUPPLEMENTAL RESPONSE EXPECTED					15. EXPECTED SUBMISSION DATE		MONTH	DAY	YEAR	
<input type="checkbox"/> YES (if yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO										
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)										
At 07:05 on 1/4/2013, Unit 2, while at 100% power, commenced surveillances 0PSP03-RS-0004 and 0PSP03-RS-0001 to satisfy the monthly requirements of Technical Specification 4.1.3.1.2. and to demonstrate the shutdown and control rods are Operable by movement of at least 10 steps in any one direction.										
During testing, two rods on shutdown bank E (SBE) dropped to the bottom of the core and a manual reactor trip was required. The dropped rods on SBE occurred while inserting shutdown bank C (SBC) rods in 6 steps. After SBE rod M-8 dropped, rod motion was stopped. While validating the dropped rod, a second rod, D-8, in SBE dropped. At 09:41, once both dropped rods were validated by diverse indications of power, flux, and rod positions, a manual reactor trip was performed. Troubleshooting identified the problem as high resistance on Rod Holdout Mode Selector (RHMS) switch contacts in Rod Control Power Cabinet SCDE when the contacts should have been closed. This blocked the multiplexing signal to the SBE Stationary Regulation card resulting in dropped rods.										
This condition is considered reportable under 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph 10 CFR 50.73(a)(2)(iv)(B). There were no personnel injuries, no offsite radiological releases, and no damage to safety-related equipment associated with this condition. This condition did not have an adverse effect on the health and safety of the public.										

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
South Texas Unit 2	05000499	YEAR	SEQUENTIAL NUMBER	REV. NO	2 OF 4
		2013	001	00	

**I. DESCRIPTION OF EVENT****A. REPORTABLE EVENT CLASSIFICATION**

This event is reportable pursuant to 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section.

**B. PLANT OPERATING CONDITIONS PRIOR TO EVENT**

South Texas Project (STP) Unit 2 was in Mode 1, with Reactor Power at approximately 100%.

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

No structures, systems, or components were inoperable at the start of the event that contributed to the event.

**D. NARRATIVE SUMMARY OF THE EVENT**

At 07:05 on 1/4/2013, Unit 2, while at 100% power, the control room commenced 0PSP03-RS-0001 "MONTHLY CONTROL ROD OPERABILITY", and 0PSP03-RS-0004 "CONTROL ROD OPERABILITY (6 AND 10 STEPS)". Surveillances 0PSP03-RS-0004 and 0PSP03-RS-0001 test the shutdown and control rods not fully inserted in the core in order to satisfy the monthly requirements of Technical Specification 4.1.3.1.2. and also provide instructions for demonstrating the shutdown and control rods not fully inserted in the core are Operable by movement of at least 10 steps in any one direction.

During testing, two rods on shutdown bank E (SBE) dropped to the bottom of the core and a manual reactor trip was required per 0POP04-RS-0001, "CONTROL ROD MALFUNCTION". The dropped rods on SBE occurred while inserting shutdown bank C (SBC) rods in 6 steps. When SBC demand reached 255, one rod in SBE dropped (M-8) while the rest of the rods in SBE transitioned from 258 to 252/246 on Digital Rod Position Indication (DRPI). Rod motion was stopped and while validating the dropped rod, a second rod in SBE dropped (D-8). At 09:41, once both dropped rods were validated by diverse indications of power, flux, and rod positions, a manual reactor trip was performed.

This event resulted in a reactor trip from 100% power. The Unit was stabilized in Mode 3 with all systems necessary to maintain shutdown conditions, remove decay heat, control the release of radioactive material, and mitigate the consequences of an accident available.

Troubleshooting identified that the problem was isolated to the Rod Holdout Mode Selector (RHMS) switch in Rod Control Power Cabinet SCDE. This is a five-position, seven deck rotary Grayhill switch used to interface with the Rod Holdout Sequencing card and other power cabinet components to accomplish the rod lockout function for rapid refueling. Switch Pin 7 to common C2 on deck F was found to have a high resistance (~300Mohms) while in the "OFF" position.

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The Rod Holdout Mode Selector switch in Rod Control Power Cabinet SCDE was replaced. To address extent of condition in Unit 2, the four other Rod Holdout Mode Selector switches in the other Rod Control Power Cabinets were tested.

**E. METHOD OF DISCOVERY**

The two dropped rods on shutdown bank E requiring a manual reactor trip were self-revealing.

**II. EVENT-DRIVEN INFORMATION****A. SAFETY SYSTEMS THAT RESPONDED**

All required safety systems responded as expected except that one of two Nuclear Instrument Source Range detectors, N32, did not energize automatically. This was identified and the function performed manually. In addition to failing to automatically energize, the source range audio count rate on N32 also failed to function. These conditions have been entered into the Corrective Action Program.

**B. DURATION OF SAFETY SYSTEM INOPERABILITY**

N/A

**C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT**

There was no impact to radiological safety, safety of the public, or safety of station personnel during this event.

The Incremental Conditional Core Damage Probability (ICCDP) for the Reactor Trip in Unit 2 on 1/4/2013 is 1.12E-07. The resulting Incremental Conditional Large Early Release Probability (CLERP) is 5.92E-08.

**III. CAUSE OF THE EVENT**

The cause of this event has been determined to be high resistance circuit on the RHMS from the C (common) contact in switch position 7 on deck F due to contamination. Even though offsite failure analysis did not reproduce the high resistive contact nor did it find evidence of contamination that could have caused this condition, enough evidence exists from other failure analysis and industry experience to conclude that contamination is the cause.

The cause of this contamination could be due to:

- The low current that flows through these contacts is not enough to burn through corrosion/carbon deposits that builds up on the contacts over time.
- Solder flux on contact surfaces.
- Grease or other contaminants.

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## IV. CORRECTIVE ACTIONS

Corrective actions will be implemented in accordance with the STP Corrective Action Program. The Rod Holdout Mode Selector switch in Rod Control Power Cabinet SCDE was replaced. Corrective actions to prevent future failures will include either a design change to address the vulnerability associated with the RHMS switch contacts or replacement of existing switches with newly manufactured switches.

## V. PREVIOUS SIMILAR EVENTS

There have been no similar reportable events at STP within the last three years. The Rod Holdout Mode Selector (RHMS) switches in the Rod Control Power Cabinets interface with the Rod Holdout Sequencing card and other power cabinet components to accomplish the rod lockout function for rapid refueling. There are no previous similar industry events as South Texas Project (STP) is the only plant that uses rapid refueling.

## VI. ADDITIONAL INFORMATION

N/A