



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

January 30, 2012
NOC-AE-12002793
File No.: G25
10 CFR 50.73
STI: 33282416

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Unit 2
Docket No. STN 50-499
Licensee Event Report 2-2011-003
Unit 2 Plant Mode change with Turbine Trip disabled

Pursuant to 10 CFR 50.73, STP Nuclear Operating Company (STPNOC) submits the attached Unit 2 Licensee Event Report (LER) 2-2011-003 regarding a condition when both Solid State Protection System (SSPS) channels of the turbine trip signals were defeated while transitioning into Mode 3.

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 Joe Loya at (361) 972-8005 or me at (361) 972-7566.

A handwritten signature in black ink, appearing to read "G. T. Powell".

G. T. Powell
Vice President, Generation

JAL

Attachment: LER 2-2011-003

IE22
NRK

Designate
Original
07/27/2015
LH/An

cc:
(paper copy)

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NRC FORM 366 (10-2010)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013 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 InfoCollection.Resource@nrc.gov , 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.																																									
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)																																														
1. FACILITY NAME South Texas Unit 2					2. DOCKET NUMBER 05000499			3. PAGE 1 OF 5																																						
4. TITLE Unit 2 Plant Mode change with Turbine Trip Disabled																																														
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																																				
11	30	2011	2011	003	0	01	30	2012	N/A	N/A																																				
9. OPERATING MODE 3			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR§: (Check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> 20.2201(b)</td> <td><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td>Specify in Abstract below or in NRC Form 366A</td> </tr> </table>								<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input checked="" 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 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 checked="" 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 checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A
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10. POWER LEVEL 0%																																														
12. LICENSEE CONTACT FOR THIS LER																																														
FACILITY NAME Joe Loya, Licensing Engineer								TELEPHONE NUMBER (Include Area Code) 361-972-8005																																						
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																																					
14. SUPPLEMENTAL RESPONSE EXPECTED						15. EXPECTED SUBMISSION DATE																																								
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) On November 20, 2011 at 0546 hours [CST], STP Unit 2 transitioned modes from Mode 4 to Mode 3. Prior to the mode change, the Solid State Protection System (SSPS) generated turbine trip signals were defeated by a maintenance work activity that installed a jumper in both channels (Train R and S) of non-class relays to the turbine trip circuit. The SSPS signals to the non-class relays that were defeated by the jumpers included the turbine trip from reactor trip breakers open (P-4), turbine trip from a reactor trip signal (P-16), and the turbine trip from Steam Generator HI-HI (P-14). In accordance with Technical Specification (TS) 3.3.2 Item 5a and 5b, P-4 and P-14 are required in Modes 1, 2, and 3. The jumpers were removed around 0930 on November 20, 2011 with U2 still in Mode 3. Since Unit 2 had changed Modes from 4 to 3 with TS 3.3.2 Item 5a and 5b and the associated Limiting Conditions of Operation (LCO) Actions not met, this is a condition prohibited by Technical Specification 3.0.4. A review of the performance of this activity in previous outages was conducted. It was identified that a similar event had occurred during 2RE14 in April of 2010. This event, including the one in April 2010, was reported as required by 10 CFR 50.72(b)(3)(v) parts (C) and (D). The Cause of the event was determined to involve the revision of the associated maintenance work activity's Preventive Maintenance Instruction (PMI). Specifically, the MODE requirement prerequisites in the PMI were revised without full consideration of the Operational restrictions associated with changing plant conditions during procedure performance. The corrective action to prevent reoccurrence includes removing the mode restrictive steps of the associated PMI while adding them to the 7300 Protection System Channel Trip Function Bypass procedure. 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**

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

This event is reportable pursuant to:

- 10 CFR 50.73(a)(2)(i)(B), Any operation or condition which was prohibited by the plant's Technical Specifications.
- 10 CFR 50.73(a)(2)(v)(C) and (D), Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (C) Control the release of radioactive material and (D) Mitigate the consequences of an accident.
- 10 CFR 50.73(a)(2)(vii)(D), Any event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to: (D) Mitigate the consequences of an accident.

B. PLANT OPERATING CONDITIONS PRIOR TO EVENT

South Texas Project (STP) Unit 2 was in Mode 3, with Reactor Power at 0%.

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

The SSPS signals to the non-class relays, a total of four relays K947R & S and K948R & S, were defeated included the following Permissives: 1. Turbine Trip from Reactor Trip breakers open (P4) 2. Turbine Trip from a Reactor Trip signal (P-16) and 3. Turbine Trip from Steam Generator HI-HI (P-14). These signals are required in Modes 1, 2, and 3.

D. NARRATIVE SUMMARY OF THE EVENT

On 11/09/2011 with the Unit 2 core offloaded to the Spent Fuel Pool (DEFUELED MODE), all SSPS generated turbine trip signals were defeated by a maintenance work activity that installed a jumper in both channels (Train R and S) of non-class relays to the turbine trip circuit. Specifically, a total of four relays K947R & S and K948R & S were defeated by the jumpers. The functions affected included the turbine trip from reactor trip breakers open (P-4), turbine trip from a reactor trip signal (P-16), and the turbine trip from Steam Generator HI-HI (P-14). With the reactor trip breakers open, a P-4 signal is generated that locks in a turbine trip signal, which closes the throttle valves (TV) and governor valves (GV). These signals are addressed in TS 3.3.2 Item 5a and 5b and are required in Modes 1, 2, and 3.

This maintenance work activity is normally done during Modes 5, 6, or defueled. The jumpers were installed per Electro Hydraulic Control System Calibration Preventive Maintenance Instruction (PMI) to support maintenance activities which included stroking the turbine throttle and governor valves. The PMI allows some sections to be performed in Modes other than 5, 6, and defueled as long as the Main Steam Header is not pressurized. However, Section 5.4 of the PMI, which installs the jumpers, was not included in this exception. Closure of this work package and removal of the jumper were not identified as a Mode 3 restraint.

On November 20, 2011 at 0546 hours, Unit 2 transitioned from Mode 4 to Mode 3.

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On 11/20/2011 0808, the Control Room Operators were questioned regarding the fact that the Reactor Trip breaker indication on Control Panel 4 indicated open and the Main Turbine Electro Hydraulic Control Console on Control Panel 6 indicated the Main Turbine latched. An investigation began to determine if this condition was appropriate for the current plant conditions. Subsequently, the Shift Manager directed maintenance to remove the electrical jumpers. The Main Turbine was manually tripped and the electrical jumpers were removed at approximately 0930 AM on 11/20/2011.

During further review of the condition by Control Room Staff, it was recognized that the plant Mode change that occurred earlier in the day with the electrical jumpers installed was likely a violation of Technical Specifications.

After an investigation of the facts surrounding this event, this condition was declared reportable on 11/30/2011 pursuant to:

- 10CFR 50.73(a)(2)(i)(B): Unit 2 changed Modes from 4 to 3 with TS 3.3.2 Item 5a and 5b and the associated LCO Actions 20 and 25 for not met for Mode 3. This is a condition prohibited by TS 3.0.4.
- 10CFR 50.73(a)(2)(v)(C) and (D): Since both channels of the turbine trip were defeated, and this function is assumed in the safety analysis, this condition could have prevented the fulfillment of the safety functions to mitigate the consequences of an accident and control the release of radiation.

On 11/30/2011 at 1513, a notification pursuant to 10CFR 50.72(b)(3)(v)(C) and 10CFR 50.72(b)(3)(v)(D) was made to the NRC Operations Center.

- 10CFR 50.73(a)(2)(vii)(D): The single cause or condition of having defeated both channels of turbine trip signals due to performance of the associated work activity defeated both channels of the turbine trip which are required to mitigate the consequences of an accident.

A review of the performance of this activity in previous outages was conducted. It was identified that during 2RE14 in April of 2010, a work package for this activity was not closed until after Mode 3 and that that a similar event had occurred.

E. METHOD OF DISCOVERY

The Technical Specification non-compliance was discovered during the observation of Control Room outage activities by a Quality Inspector.

II. EVENT-DRIVEN INFORMATION

A. SAFETY SYSTEMS THAT RESPONDED

N/A

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B. DURATION OF SAFETY SYSTEM INOPERABILITY

On 11/20/2011 at 0546, Unit 2 met the plant conditions and entered MODE 3 Hot Standby with the electrical jumpers in place preventing automatic tripping the Main Turbine. The Main Turbine was manually tripped and the electrical jumpers were removed at approximately 0930 AM on 11/20/2011. Therefore, the duration of safety system inoperability was approximately 3 hrs and 45 minutes.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The purpose of the turbine trip on reactor trip is to prevent overcooling the RCS after a reactor trip. Without the turbine trip on a reactor trip, the turbine would continue to draw steam from the steam generators until the main steam isolation valves close due to a compensated steam line pressure signal. This could result in a significant decrease in RCS coolant temperature which could result in a return to criticality and the fuel experiencing Departure from Nucleate Boiling (DNB). However, this event is bounded by the double-ended steam line break analysis which shows that DNB does not occur. A failure of the turbine trip on reactor trip also could result in the uncovering of the steam generator tubes, which could in an increase in calculated dose due to a reduction in the partition factor assumed in the safety analysis. However, the radionuclides in the steam would steam would plate out in the condenser which would more than offset the decrease in partition factor assumed in the safety analysis. Therefore, the failure of the turbine to trip on a reactor trip does not significantly degrade plant safety.

Although Unit 2 was in Mode 3, with the reactor trip breakers open, and turbine throttle valves closed while the jumpers were installed, this condition is conservatively considered to be a safety system functional failure. There was no work process prevention to assure the jumpers would be properly removed; consequently, this condition COULD have prevented the fulfillment of the control of the release radioactive materials or mitigating the consequences of an event.

A risk analysis was performed to determine the risk significance of having P-16 bypassed or defeated while changing plant Mode for Mode 4 to Mode 3. Since a P-16 actuation would result in a signal to close the main turbine governor and throttle valves and it has been shown that the throttle valves were in the closed position for the entire time period P-16 was bypassed, the evaluation concluded that there was no increase in the risk of core damage or large early release. Consequently, there is no adverse effect on the health and safety of the public.

III. CAUSE OF THE EVENT

The MODE requirement prerequisites in the Preventive Maintenance Instruction were revised without full consideration of the Operational restrictions associated with changing plant conditions during procedure performance.

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IV. CORRECTIVE ACTIONS

- A. To ensure the jumpers are carried in the procedure that is easily tracked for mode restraints:
- Remove mode restrictive steps of PMI-IC-EH-0003 (section for turbine trip defeat jumper installation) and,
 - Add mode restrictive steps in the 7300 Protection System Channel Trip Function Bypass procedure (PMP08-BS-0002).
- B. Revise procedure 0PAP01-ZA-0102 (Plant Procedures) to include process for revision of PMI's.
- C. Develop and distribute lessons learned to all procedure writer certified personnel on the importance of close evaluation of re-performing License Compliance Reviews when Review and Comments cycle result in intent change to a procedure step.

V. PREVIOUS SIMILAR EVENTS

A review of work history for the last 3 years indicated the associated maintenance activity had been performed five times. There was only one other instance when this work package was not closed out until after Mode 3. This condition occurred during Unit 2 Refueling Outage in April 2010.

VI. ADDITIONAL INFORMATION

N/A