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

April 4, 2011
NOC-AE-11002659
File No.: G25
10 CFR 50.73
STI: 32845776

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
Revision 1 of Licensee Event Report 2010-005
Startup Feed Pump 24 Breaker Failure and Unit 2 Reactor Trip

Reference: Letter dated January 3, 2011, from L. W. Peter, STPNOC, to NRC Document Control Desk, "Licensee Event Report 2010-005 Startup Feed Pump 24 Breaker Failure and Unit 2 Reactor Trip," (NOC-AE-10002630) (ML110070064)

Pursuant to 10 CFR 50.73, STP Nuclear Operating Company (STPNOC) submits the attached Unit 2 Licensee Event Report (LER) 2010-005 Revision 1 to address the Unit 2 Reactor trip that occurred on November 3, 2010.

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.

Per Revision 0 of this LER, a planned supplement was scheduled to be submitted no later than on April 4, 2011 based on the completion of the root cause evaluation including the event failure analysis. Since the failure analysis of the event is still under review, an additional planned Supplemental LER will be submitted no later than July 7, 2011.

There are no commitments contained in this LER.

If there are any questions on this submittal, please contact either J. A. Loya at (361) 972-8005 or me at (361) 972-7158.

L. W. Peter
Plant General Manager

JAL

Attachment: Supplement 1 of LER 2010-005 Rev. 1

IE22
NRR

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 Infocollects.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	2. DOCKET NUMBER	3. PAGE
South Texas Unit 2	05000499	1 OF 4

4. TITLE

Startup Feed Pump 24 Breaker Failure and Unit 2 Reactor Trip

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
									N/A	N/A
11	03	2010	2010	005	1	04	04	2011	N/A	N/A

9. OPERATING MODE

1

10. POWER LEVEL

100%

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

- ☐ 20.2201(b)
- ☐ 20.2201 (b)20.2201
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☑ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☑ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below Or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Joe Loya, Licensing Engineer	361-972-8005

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 RESPONSE EXPECTED

☑ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☐ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
07	07	2011

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

On November 3, 2010, the Startup Feed Pump (SUFP) 24 was being started to support a scheduled Partial Discharge Analysis as a preventive maintenance activity. At 1021 hours the SUFP was started but then after approximately 4 seconds the pump breaker tripped open. Computer data shows that approximately 8 seconds after the pump breaker tripped the voltage on Standby Bus 2H (which supplies power to the SUFP) spiked low to near zero volts and the Unit 2 reactor tripped on Reactor Coolant Pump (RCP) Undervoltage (the 2C RCP is also powered by Standby Bus 2H) . Standby Diesel Generator 23 started and began supplying Engineered Safety Features (ESF) Bus E2C due to Loss of Offsite Power to the ESF bus. Standby Bus 2F experienced a momentary voltage drop of approximately 1 second (Standby Buses 2F and 2H are both fed by the X winding of the Unit 2 Auxiliary Transformer) resulting in some A train loads being secured. Following the reactor trip, the plant was stabilized in MODE 3 at Normal Operating Pressure and Temperature.

At 1038 hours an Unusual Event was declared for Unit 2 due to the breaker cubicle explosion associated with the SUFP breaker failure (ENS Event Number 46387). The breaker malfunction did not result in a fire. The Unusual Event was terminated at 1240 hours when the plant was stabilized in MODE 3.

There were no personnel injuries, no offsite radiological releases, and no damage to safety-related equipment.

Per Revision 0 of this LER, a planned supplement was scheduled to be submitted no later than on April 4, 2011 based on the completion of the root cause evaluation including the event failure analysis. Since the failure analysis of the event is still under review, an additional planned Supplemental LER will be submitted as indicated above.

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 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 structures, systems, or components were inoperable at the start of the event that contributed to the event.

D. NARRATIVE SUMMARY OF THE EVENT

On November 3, 2010, the Startup Feed Pump (SUFP) 24 was being started to support a scheduled Partial Discharge Analysis as a preventive maintenance activity. Following the pre-job brief, a Licensed Operator Training (LOT) Trainee made a plant announcement and then placed the hand switch to Start at 1021 hours. The SUFP started but then after approximately 4 seconds the pump breaker tripped open. Computer data shows that approximately 8 seconds after the pump breaker tripped the voltage on Standby Bus 2H (which supplies power to the SUFP) spiked low to near zero volts and the Unit 2 reactor tripped on Reactor Coolant Pump (RCP) Undervoltage (the 2C RCP is also powered by Standby Bus 2H) . Standby Diesel Generator (SDG) 23 started and began supplying Engineered Safety Features (ESF) Bus E2C due to Loss of Offsite Power (LOOP) to the ESF bus. Standby Bus 2F experienced a momentary voltage drop of approximately 1 second duration (Standby Buses 2F and 2H are both fed by the X winding of the Unit 2 Auxiliary Transformer) resulting in some A train loads being secured, however the low voltage condition cleared on Bus 2F prior to the point at which associated time delay relays would have started Standby Diesel Generator 21 (ESF Train A). Following the reactor trip, the plant was stabilized in MODE 3 at Normal Operating Pressure and Temperature.

At 1038 hours an Unusual Event was declared for Unit 2 due to the breaker cubicle explosion associated with the SUFP breaker failure (ENS Event Number 46387). The breaker malfunction did not result in a fire. The Unusual Event was terminated at 1240 hours when the plant was stabilized in MODE 3.

An Operator in the Turbine Generator Building (TGB) reported substantial damage had occurred to the SUFP Breaker. The front door and access panels for Cubicle 1A in 13.8 KV Standby Bus 2H had been blown open or deformed.

All protective relay's red flags were actuated on the SUFP motor breaker cubicle except for the

lower unit of the 46 current balance relay. Most of the relay flags were probably caused by shock/vibration from the breaker explosion except for the 86 Lockout Relay, which requires rotary motion to actuate. It is unclear whether the 86 Lockout Relay was actuated by shock/vibration causing one of the associated protective relays (50/51, 51G, 87, 46) to momentarily close an output contact resulting in the electrical actuation of the 86 relay or whether the 86 relay was actuated when one or more of the protective relays was actuated by a valid signal.

The three arc chute assemblies (one per phase) showed signs of damage and were dark with black soot. The three blow-out coil return straps showed substantial damage. These straps are approximately 1 inch wide by 1/8 inch thick. When a breaker trips and the contacts open to interrupt the current, the resulting arcs from the arcing contacts transfer to the blow-out coil assembly, which includes the blow-out coil return straps. The coils produce a magnetic field which helps to push the arcs into the arc chutes where the arcs are dissipated and cooled. The three return straps had each been melted through which indicates multiple arcs had existed across the breaker contacts during the event.

E. METHOD OF DISCOVERY

The breaker failure, reactor trip, and automatic actuation of the systems listed below were self-revealing.

II. EVENT-DRIVEN INFORMATION

A. SAFETY SYSTEMS THAT RESPONDED

All required safety systems responded as expected including the following actuations:

1. Reactor Coolant Pump Undervoltage Reactor Trip
2. Reactor Protection System P-16, Turbine Trip
3. Feedwater Isolation Actuation
4. CRE HVAC Emergency Recirculation (C Train LOOP)
5. Reactor Containment Fan Coolers (C Train LOOP)
6. Auxiliary Feedwater Actuation (All AFW pumps actuated)
7. Primary Pressure Control (Pressurizer Spray and Heaters actuated as required)
8. Secondary Pressure Control Actuation (Steam Dumps Actuated)

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 November 3, 2010 is 2.82E-07. The resulting Incremental Conditional Large Early Release Probability (LERP) given a turbine trip is 7.21E-09.

III. CAUSE OF THE EVENT

The Root Cause of the breaker failure is under investigation and will be submitted in the planned LER supplement.

IV. CORRECTIVE ACTIONS

The Root Cause of the event, including the resulting corrective actions, is under investigation and will be submitted in the planned LER supplement.

V. PREVIOUS SIMILAR EVENTS

There have been no similar events within the last three years.

VI. ADDITIONAL INFORMATION

A supplement to this Licensee Event Report will be submitted by July 7, 2011.