



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

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April 23, 2001  
NOC-AE-01001075  
File No.: G26  
10CFR50.73  
STI: 31268297

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 01-002  
Manual Reactor Trip

Pursuant to 10CFR50.73, South Texas Project submits the attached Unit 2 Licensee Event Report 01-002 regarding a manual reactor trip. This event did not have an adverse effect on the health and safety of the public.

Licensee commitments are listed in the Corrective Action section of the attachment. If there are any questions on this submittal, please contact either R. D. Piggott at (361) 972-7438 or me at (361) 972-7800.

A handwritten signature in black ink, appearing to read "G. L. Parkey".

G. L. Parkey  
Plant General Manager

Attachment: LER 01-002 (South Texas, Unit 2)

IE22

cc:

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

<b>NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION</b> <b>(1-2001) COMMISSION</b>  <div style="text-align: center;"><b>LICENSEE EVENT REPORT (LER)</b></div> <div style="text-align: center; font-size: small;">(See reverse for required number of digits/characters for each block)</div>					<b>APPROVED BY OMB NO. 3150-0104 EXPIRES 6-30-2001</b>  <small>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.</small>					
<b>FACILITY NAME (1)</b> South Texas Unit 2					<b>DOCKET NUMBER (2)</b> 05000 499		<b>PAGE (3)</b> 1 OF 4			
<b>TITLE (4)</b> Manual Reactor Trip as a Result of Switchyard Breaker Failure										
<b>EVENT DATE (5)</b>			<b>LER NUMBER (6)</b>			<b>REPORT DATE (7)</b>			<b>OTHER FACILITIES INVOLVED (8)</b>	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	01	2001	01	- 002 -	00	04	23	2001	FACILITY NAME	DOCKET NUMBER
										05000
										05000
<b>OPERATING MODE (9)</b>		1		<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)</b>						
				20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
<b>POWER LEVEL (10)</b>		95%		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)		<input checked="" type="checkbox"/> 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 Specify in Abstract below or in NRC Form 366A
				20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		
				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)		
<b>LICENSEE CONTACT FOR THIS LER (12)</b>										
<b>NAME</b> R. D. Piggott						<b>TELEPHONE NUMBER (Include Area Code)</b> 361-972-7438				
<b>COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)</b>										
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	
B	FK	BKR		Yes						
<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>						<b>EXPECTED SUBMISSION DATE (15)</b>		MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).				<input checked="" type="checkbox"/> NO						
<b>ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)</b>  <p>On March 1, 2001, at 0821, Unit 2 was operating at 95% power, activities were underway to remove the 345kV switchyard North Bus for maintenance. Switchyard breaker Y590 was opened. Unknown to the operating crew, the C phase pole of switchyard breaker Y600 which had been previously closed, remained opened. With the C phase pole of breaker Y600 still opened, the Control Room received electrical panel alarms and the three operating Circulating Water Pumps tripped offline, requiring the operating crew to initiate a manual reactor trip in accordance with plant procedures. All control rods fully inserted. All actuated safety equipment operated as required. The root cause identified for this event is failure of the operating linkage of switchyard breaker Y600 C phase pole. The bushing required between the linkage pin and the operating linkage was not installed and most likely left out during fabrication. Corrective actions include repair of the failed breaker, inspection of a similar switchyard breaker, and further review of switchyard breaker inspection procedures.</p> <p>This event was reviewed for risk impact and found to be risk insignificant since the conditional core damage probability is less than <math>2 \times 10^{-7}</math>.</p>										

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)		DOCKET (2)	LER NUMBER (6)			PAGE (3)
South Texas Unit 2		05000-499	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
			2001	-- 002 --	00	

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

**DESCRIPTION OF EVENT:**

On March 1, 2001, preparations were underway to align the main 345kV switchyard breakers for North Bus maintenance. At approximately 0700 CST switchyard breakers Y600 and Y610 were opened. The manual disconnect for the "Skyline" offsite transmission feed was then opened to take the "Skyline" circuit out of service while the North Bus was out of service. After the "Skyline" manual disconnect was opened, breakers Y600 and Y610 were closed. Unknown to the operating and switchyard crews, the C phase pole of breaker Y600 remained opened (indicated fully closed). At 0821 switchyard breaker Y590 was opened. With the C phase pole of breaker Y600 still opened, the Control Room received electrical panel alarms and Circulating Water Pump 21 tripped offline on a phase balance current relay (46 relay). The open C phase pole created a phase imbalance condition that was sensed by generator and Circulating Water motor protection relays once breaker Y590 was opened. Standby Bus 2F and Auxiliary Bus 2H high voltage alarms and a generator negative phase sequence current alarm were received. This was followed closely by the trip of the remaining operating Circulating Water Pumps 22 and 24, requiring the operating crew to initiate a manual reactor trip in accordance with plant procedures. All control rods fully inserted. The Auxiliary Feedwater System actuated on low-low steam generator water level as expected. All safety equipment operated as required. The control room crew closed the main steam isolation valves due to the condenser not being available.

**CAUSE OF EVENT**

The linkage mechanism that operates the breaker Y600 C phase pole failed due to a linkage connection pin falling out of the linkage. Inspection revealed that a bushing that is required between the linkage pin and the operating linkage was not installed. The bushing was most likely left out during fabrication. The lack of a bushing creates increased friction and tolerances leading to accelerated wear of the components.

**CORRECTIVE ACTIONS**

1. Switchyard breaker Y600 was satisfactorily repaired and tested.
2. The operating mechanism for switchyard breaker Y640 was inspected for generic implications. The operating mechanism and linkage pins were found to be satisfactory. Switchyard breaker Y640 is the only breaker installed in the switchyard with an operating mechanism the same as breaker Y600.
3. Switchyard inspection procedures will be reviewed to determine if improvements are needed. The review will specifically cover receipt inspection of new breakers installed in the switchyard to ensure breakers are not installed with similar operating mechanism manufacturing defects. This action will be completed by July 18, 2001.

**ANALYSIS OF EVENT:**

A notification was made to the Nuclear Regulatory Commission on March 1, 2001 at 1255 pursuant to 10CFR50.72(b)(2)(iv)(B) for an actuation of the Reactor Protective System and 10CFR50.72(b)(3)(iv)(A) for the actuation of specified systems.

The conditional core damage probability (CCDP) for a reactor trip is approximately  $2 \times 10^{-07}$ .

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

**ADDITIONAL INFORMATION:**

In the past three years there have been no similar events regarding failure of the operating mechanism of a switchyard breaker. However, there were two events regarding switchyard breaker failures in March 1999 and June 2000 that were documented on Condition Reports 99-3690 and 00-9916, respectively.

The Y600 breaker is a 362 kV Mitsubishi 300 SFMT 50E breaker, serial number 970240101.

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

## 345 kV Switchyard Normal Operation

