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

October 5, 2000
NOC-AE-00000936
File No.: G26
10CFR50.73
STI: 31176451

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 00-004
Circuit Breaker Trip

Pursuant to 10CFR50.73, South Texas Project submits the attached Unit 2 Licensee Event Report 00-004 regarding a circuit breaker found to have been inoperable longer than the Technical Specification allowed time. 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 Mr. S. M. Head at (361) 972-7136 or me at (361) 972-7800.

G. L. Parkey
Plant General Manager

kaw

Attachment: LER 00-004 (South Texas, Unit 2)

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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

LICENSEE EVENT REPORT (LER)

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

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TITLE (4)

Circuit Breaker Trip

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
08	29	2000	2000	-- 0 0 4	-- 00	10	05	2000	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
			20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)	100%		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Scott Head - Licensing Supervisor	(361) 972-7136

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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

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

On August 29, 2000, at 0038 hours (CDT), Unit 2 was at 100% power when it experienced a loss of power to one train due to tripping of the feeder breaker for a Class 1E 480V motor control center. The incident occurred while restoring the associated standby diesel generator to service, causing the circuit breaker to trip due to an apparent overload condition. The circuit breaker was found to have an incorrect current transformer installed, and a new breaker with the correct current transformer was installed by 1737 hours on August 29, 2000. The failed breaker had been in operation since the last Unit 2 refueling outage in October 1999. Equipment powered from the motor control center was determined to have been inoperable since October 23, 1999, because opening of the breaker would have interrupted the ability of the equipment to perform its design function. The duration of the inoperability exceeded the Technical Specification allowed outage time, which is reportable to the Nuclear Regulatory Commission pursuant to 10CFR50.73(a)(2)(i). The root cause for this event was less than adequate work instructions in the work order used to change out the current transformers in 1992. Corrective actions include replacing the current transformer for this circuit breaker, revising the breaker maintenance procedure to perform a primary injection test if the breaker has been overhauled, discussing lessons learned with Electrical planners and Electrical Maintenance personnel, and incorporating the lessons learned in continuing training for Electrical Maintenance personnel.

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

DESCRIPTION OF EVENT

On August 29, 2000, at 0038 CDT, Unit 2 was at 100% power when it experienced a loss of power to one train due to tripping of a Class 1E 480V motor control center. The incident occurred while restoring the associated standby diesel generator to service, causing the circuit breaker to open on over-current input, de-energizing the loads fed from this motor control center. The circuit breaker trip caused loss of power to motor control center E2C1 that began a 2-hour action statement due to the loss of the energized train "C" battery charger. The trip unit was reset and the breaker re-closed approximately 30 minutes after the trip. The motor control center loads were re-energized one by one with no anomalies encountered. The breaker remained close until approximately 1737 hours on August 29, 2000, when it was replaced with a new breaker with the correct transformer. All systems functioned as designed and there were no adverse effects on the health and safety of the public as a result of this condition. The event was reported to the Nuclear Regulatory Commission at 1213 hours (EDT) on September 6, 2000.

Troubleshooting actions tested the tripped breaker by applying secondary and primary injection to determine the as-found conditions. The secondary injection test found the values to be within tolerance. However, the primary injection values failed to meet tolerances. After further investigation it was found that the current transformers on the back of the breaker were 300 amp instead of 600 amp as indicated on the breaker's nameplate. With the incorrect current transformer installed the circuit breaker's trip setpoint was essentially reduced by half.

The tripped circuit breaker was a Westinghouse DS-206, 800-amp frame, which had been refurbished by Cutler-Hammer on June 30, 1999. The test data sheet returned by the vendor indicated that the circuit breaker contained a 300A current transformer. However, data from the nameplate was not shown on the vendor correspondence that might have identified the discrepancy between 300A and 600A. This circuit breaker was installed in load center E2C cubicle on October 23, 1999. Testing was performed in accordance with STP procedures, which directs the performer to test the breaker by primary injection only if required by a surveillance procedure; otherwise only secondary injection testing is performed. This breaker did not require a primary injection test. When the breaker was tested by secondary injection, as required during installation, the wrong current transformer was not identified.

A historical review was performed to locate the documentation and identify the date that the current transformer was changed on the circuit breaker involved in this event. The review indicated that the circuit breaker was installed in a spare circuit breaker cubicle in 1992. Prior to installing this circuit breaker, the 600A current transformer in the circuit breaker was replaced with a 300A current transformer to match the drawing configuration for the spare cubicle. However, the nameplate was not changed to reflect the new information. The nameplate for this circuit breaker was changed on September 18, 2000.

Some safety related equipment powered from the motor control center was determined to have been inoperable since October 23, 1999, because opening of the breaker would have interrupted the ability of the equipment to perform its design function. The duration of the inoperability exceeded the Technical Specification allowed outage time for some safety systems including:

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

- 1 of 3 trains of Essential Chilled Water (TS 3/ 4.7.14): inoperable essential chilled waster pump 21C
- 1 of 3 trains of Control Room Envelope HVAC (TS 3/4.7.7)-inoperable makeup fan 21C
- 1 of 3 trains Standby Diesel Generators (TS 3/4.8.1)-inoperable emergency supply fan 21C (support system for SDG 23)

This condition is reportable to the Nuclear Regulatory Commission in accordance with 10CFR50.73(a)(2)(i).

CAUSE OF EVENT

The root cause for this event was less than adequate work instructions in the work order used to change out the current transformers in 1992. When the current transformer was replaced in the circuit breaker, the nameplate on the circuit breaker was not updated to reflect the correct information.

CORRECTIVE ACTIONS

The following corrective actions have been or will be taken:

1. The correct current transformer was installed for this circuit breaker on August 30, 2000.

2. The breaker maintenance procedure will be revised to perform a primary injection test if the breaker has been overhauled. This action will be competed by December 15, 2000.

3. Electrical Maintenance will incorporate lessons learned from this event in their continuing training. This will be completed by December 15, 2000.

4. Lessons learned from this event will be discussed with the Electrical planners and Electrical Maintenance personnel. This action will be completed by October 11, 2000.

ANALYSIS OF EVENT

When the circuit breaker trip caused a loss of power to motor control center E2C1, a chemical and volume control system letdown isolation occurred due to loss of power to valve FV-0011. This required intervention by control room personnel to reestablish letdown. There were no adverse consequences as a result of this event and there is no safety significance to this event. This event did not involve any personnel injury, radiation exposure, offsite dose release, or damage to equipment important to safety.

The South Texas Project Probabilistic Risk Assessment model was used to evaluate the effects of this event. Several cases were modeled to calculate the core damage frequency value associated with the failure of the equipment. The overall risk to public from this event, as determined by changes in core damage frequency, is less than 1×10^{-06} per year. Failure of the feeder breaker to MCC E2C1 at a current less than the design current affects the equipment powered from MCC E2C1. In the South Texas Project PRA, the major equipment supplied by this MCC are:

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Standby Diesel Generator 23 Emergency Supply Fan
Essential Chilled Water Train C Pump
EAB Train C Main Area Return Fan
AFW Train C Flow Control and Containment Isolation MOVs
One of two RHR Train B and Train C Suction Isolation MOVs
Steam Generator C PORV
Centrifugal Charging Pump A Room Cooling Fans
One of two Class 1E DC Train C Battery Chargers

When all active loads are assumed to fail with no recovery, core damage frequency increases to 2.6×10^{-05} per year (an increase of 1.9×10^{-05} per year over the actual plant core damage frequency monitored by the STP computer program RASCAL.

Recovery of electrical auxiliary building HVAC return fan is substantiated by the following postulations:

- Loss of the EAB HVAC system has no effect on plant operation for at least twenty-four hours after loss if the abnormal procedure is followed.
- After twelve hours, operator action to reset, repair or replace the MCC feeder breaker will allow the EAB HVAC return fan to operate normally.

Recovery of residual heat removal and auxiliary feedwater is substantiated by the following postulations:

- The RHR system is not required for several hours following the SGTR and requires successful auxiliary feedwater system operation and successful operator response.
- The delay in the need for RHR allows time for the operators to successfully recover from failure of the MCC feeder breaker prior to RHR initiation.
- If the feeder breaker has not tripped prior to the need for RHR, the MOV stroke time is very much less than the long-time over-current setpoint.
- Because of the short stroke times, the AFW OCIV, MOV-0085, and the flow control valve FV-7523 will be open prior to failure of the MCC feeder breaker.
- Operator action to control AFW flow to the 2C steam generator locally at the valve or by cycling the AFW pump will mitigate the loss of power to the flow control valve if the feeder breaker trips after 400-600 seconds.

Recovery of standby diesel generator emergency ventilation is substantiated by the following postulations:

- The standby diesel generator will operate normally in response to a loss of offsite power initiating event or post trip loss of offsite power condition.

Recovery of essential chilled water is substantiated by the following postulations:

- The primary loads, EAB and control room HVAC, are backed up by smoke purge operation.
- Loss of these systems requires at least 24 hours to affect equipment response.
- The safety injection pump room coolers also require essential chilled water.
- Operator action to start or restart the Train C essential chilled water pump will restore cooling to these pump rooms prior to equipment failure.

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

Recovery of the train C steam generator power operated relief valve is substantiated by the following postulations:

- A SG PORV is capable of one and one-half strokes using the stored energy in the attached accumulator.
- Procedure guidance on PORV operation with no power to the hydraulic pump motor is provided in the plant emergency procedures and is included in operator training.
- The core damage sequences which include failure of the PORV on SG C are primarily a result of a steam generator tube rupture or a small LOCA initiating event. For both initiators, all remaining SG PORVs are also failed.
- The PRA currently does not include operator action to recover from SG PORV failure because the frequency of core damage from these sequences less than 1×10^{-07} per year.
- Operator action to restore power to the motor-control center will restore power to the SG PORV hydraulic motor and thus normal operation to the SG PORV. Operator action consists of limiting the number of strokes, and restoring power to the hydraulic motor. While this action is being implemented, any SG safety valve can provide decay heat removal

Because of the three train plant design at STP, the active planned maintenance program controls, and the type of equipment failures induced by the premature opening of the MCC feeder breaker, the overall change in core damage frequency, is less than 1×10^{-06} per year.

ADDITIONAL INFORMATION

There are approximately 200 Westinghouse "DS" circuit breakers on site in safety and non-safety related applications. All of these circuit breakers were originally bought under a safety-related purchase order and are interchangeable. The historical review found that several breakers were swapped and modified during start-up under the Configuration Control Package program. In most instances the Configuration Control Program instructions did not include the correction of the nameplate on the breaker. There was one other circuit breaker found where the 600A current transformer was replaced with a 300 A current transformer, but the nameplate was not changed. The generic implications of this event are bounded to all 480-volt load centers on site. Documentation associated with the Westinghouse DS circuit breakers was reviewed to verify that this condition does not exist elsewhere.

An additional action is being done as an added step to ensure the correct current transformer is installed in circuit breakers. A step will be added to the overhaul preventive maintenance work instructions to ensure that primary injection tests are performed prior to circuit breakers that have been overhauled.