



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


September 20, 2000  
NOC-AE-00000924  
File No.: G29  
10CFR50.73  
STI: 31169564

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

South Texas Project  
Unit 1  
Docket No. STN 50-498  
Licensee Event Report 00-006  
Two Trains of Essential Chilled Water System Inoperable

Pursuant to 10CFR50.73, South Texas Project submits the attached Unit 1 Licensee Event Report 00-006, regarding Two Trains of Essential Chilled Water System being Inoperable. This event did not have an adverse effect on the health and safety of the public.

Licensee commitments are listed in the Corrective Actions 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

PLA

Attachment: LER 00-006 (South Texas, Unit 1)

IE 22

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Washington, D.C. 20555-0001

**LICENSEE EVENT REPORT (LER)**(See reverse for required number of  
digits/characters for each block)

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.

FACILITY NAME (1)

South Texas Unit 1

DOCKET NUMBER (2)

05000 498

PAGE (3)

1 of 4

TITLE (4)

Two Trains of Essential Chilled Water System Inoperable

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
08	21	2000	2000	00600		09	20	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)							
POWER LEVEL (10)		100%	20.2203(a)(1)		20.2203(a)(2)(v)		X		50.73(a)(2)(i)	50.73(a)(2)(viii)
			20.2203(a)(2)(i)		20.2203(a)(3)(i)				50.73(a)(2)(ii)	50.73(a)(2)(x)
			20.2203(a)(2)(ii)		20.2203(a)(3)(ii)				50.73(a)(2)(iii)	73.71
			20.2203(a)(2)(iii)		20.2203(a)(4)				50.73(a)(2)(iv)	OTHER
			20.2203(a)(2)(iv)		50.36(c)(1)				50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
					50.36(c)(2)				50.73(a)(2)(vii)	

**LICENSEE CONTACT FOR THIS LER (12)**

NAME

Scott Head - Licensing Supervisor

TELEPHONE NUMBER (Include Area Code)

(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
X	KM	CHU	York	Yes					

**SUPPLEMENTAL REPORT EXPECTED (14)**

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On August 20, 2000 at 0346, C Train Essential Chilled Water was secured in preparation for scheduled maintenance. Essential Chiller 12A was started at 0512 and verified to be running normally. Essential Chiller 12C was removed from service (declared inoperable) at 0400 on August 21, 2000. On August 21, 2000 at about 0645, Essential Chiller 12A was observed to be spraying oil from the top of the purge unit. The oil level in Essential Chiller 12A was found to be abnormally low. The Control Room immediately secured the chiller and declared it inoperable. Technical Specification 3.7.14 has no provisions for Mode 1 operation with two trains of Essential Chilled Water inoperable; therefore, Technical Specification 3.0.3 was entered at 0645. Since no maintenance on Essential Chiller 12C had started, the unit was restored to operable status at 0754 on August 21, 2000 and Technical Specification 3.0.3 was exited at 0754. The root cause of this event was concurrent failure of the level control system due to debris induced mechanical binding of the upper float assembly and failure of the float check valve. Corrective actions include restoring Essential Chiller 12C to operable status, replacing defective parts in Chiller 12A, and developing and scheduling Preventive Maintenance activities for each of the 300-ton chillers.

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

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
SOUTH TEXAS, UNIT 1	05000 498	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 4
		00	- 006 -	00	

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

On August 20, 2000 at 0346, C Train Essential Chilled Water was secured in preparation for scheduled maintenance. As part of the normal process to remove a chiller from service, Essential Chiller 12A was started at 0512 and verified to be running normally. The next day, August 21, at approximately 0350, Essential Chiller 12A was again verified to be running normally prior to hanging the Equipment Clearance Order on Essential Chiller 12C. Essential Chiller 12C was removed from service (declared inoperable) at 0400 on August 21, 2000. On August 21, 2000 at about 0645, Essential Chiller 12A was observed to be spraying oil from the top of the purge unit. The oil level in Essential Chiller 12A was found to be abnormally low. The situation was reported to the Control Room. The Control Room immediately secured the chiller and declared it inoperable. No alarms were received in the Control Room during this event.

Technical Specification 3.7.14 has no provisions for Mode 1 operation with two trains of Essential Chilled Water inoperable; therefore, Technical Specification 3.0.3 was entered at 0645. Since no maintenance on Essential Chiller 12C had started, the unit was restored to operable status at 0754 on August 21, 2000 and Technical Specification 3.0.3 was exited at 0754.

A post-event walkdown identified oil on overhead piping which, based on the oil spray pattern, came from the purge exhaust line. No evidence of broken or loose connections existed. No other parts of the chiller revealed evidence of oil leakage. Oil loss was estimated at approximately seven gallons based on amount of oil later removed from the chiller. Based on these findings, it was determined that a failure of the level control system occurred. This failure caused the purge unit to fill with oil, which concurrent with a failure to seat the float check valve, resulted in oil being pumped out of the foul gas exhaust line. The failure of the level control system is attributed to mechanical binding of the upper float assembly caused by debris internal to the purge unit. The purge unit is a dirty point in the system. It takes all the air and moisture that leaks into the chiller, and vents it. Due to the presence of moisture, all of the following can be present: acid, rust, corrosion products, and debris. The current chiller Preventive Maintenance scope does not clean debris from inside the purge unit.

The float check valve also did not operate properly to prevent oil passing through the exhaust vent when the level control failure occurred. Inspection of the float check valve revealed age-related degradation (swelling, reducing operation clearances, etc.) of the plastic float that contributed to improper operation. For details of system operation, see Figure 1.

**CAUSE OF EVENT**

The cause of this event was concurrent failure of the level control system due to debris induced mechanical binding of the upper float assembly and failure of the float check valve. The float check valve failure was due to a previously unidentified failure mechanism of age related degradation.



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ANALYSIS OF EVENT

A notification was made to the Nuclear Regulatory Commission on August 21, 2000 (Event 37241) for Unit 1 entering Technical Specification 3.0.3 due to two trains of Essential Chilled Water being inoperable. Train C Essential Chilled Water was removed from service for planned maintenance. Train A Essential Chilled Water became inoperable due to loss of oil level in Essential Chiller 12A. There were no adverse safety or radiological effects on the health and safety of the public as a result of this event.

CORRECTIVE ACTIONS

1. Essential Chiller 12C was restored to an operable status at 0754 on August 21<sup>st</sup>, 2000.
2. The relief valve, shut-off safety float check valve, float switch and three-way oil supply solenoid valve were replaced on Essential Chiller 12A and the chiller was restored to an operable status on August 22<sup>nd</sup>, 2000.
3. Develop Preventive Maintenance Activities and instructions with appropriate frequency for each of the 300-ton chillers. The Preventive Maintenance scope will include an inspection and cleaning of the purge tank and float switch and replacement of the shut-off safety float check valve. This will be completed by October 31<sup>st</sup>, 2000.
4. Inspect and clean the purge tank and float switch, and replace the shut-off safety float check valves on the 300-ton essential chillers. These will be completed by November 30<sup>th</sup>, 2000.

ADDITIONAL INFORMATION

There have been no other previous events reported by South Texas Project to the Nuclear Regulatory Commission within the last three years similar to this occurrence.

A review of chiller work history revealed three purge unit failures in 1993 resulting in a loss of oil from the exhaust. In two occurrences, the cause was attributed to a stuck float switch due to contamination. The third was attributed to a defective switch. The corrective action for these events was to inspect the float switch assemblies for all essential chillers on the same periodicity as the oil change. During this time frame, the health of the Essential Chillers was a concern and as a result, STP embarked upon an effort to improve performance. This effort resulted in the installation of clean-up kits that have demonstrated high effectiveness in improving the internal cleanliness of the units. Based on a history of satisfactory purge unit inspections and a lack of chiller problems, a decision was made in 1998 to eliminate the level switch cleaning activity. Resumption of the cleaning of the level switch combined with periodic cleaning the purge drum should address the issues identified in this event.

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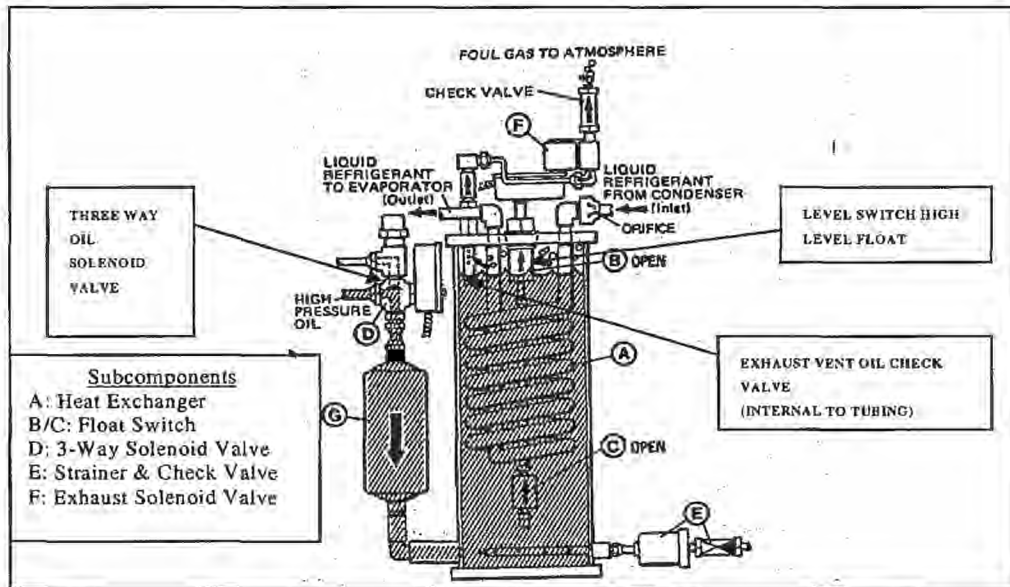


Figure 1: York Chiller Purge Unit – At High Level

**SYSTEM OPERATION**

The purpose of the purge system is to remove air and non-condensable gases from the refrigerant system in the chiller. Cold liquid refrigerant is passed through coils in the purge unit to the condenser, minimizing the amount of refrigerant (because it is condensed) expelled with the air and non-condensable gases during venting. An oil level switch controls the oil fill and drain cycle of the purge unit. At the low-level setting a three-way oil solenoid repositions to direct oil from the chiller oil pump discharge to the purge unit. When the high level setting is reached, the three way oil solenoid valve changes position and all the oil once again is directed to the compressor for lubrication (draining the oil from the purge unit). If air and non-condensable gases are present, pressure will develop as the oil level rises in the purge unit. A pressure switch opens an exhaust solenoid at 27 psig to expel the air and non-condensable gases to the space. A float-type check valve in the exhaust line will rise to block off the exhaust vent path if the purge unit becomes totally filled with oil. Also, the 300-ton chillers have a relief valve (set to lift at 50 psig) on the purge unit to protect it from over-pressurization. The oil pump on the chiller operates at approximately 40 psig discharge pressure.