

TUELECTRIC

Log # TXX-93159
File # 10200
Ref. # 10CFR50.73(a)(2)(iv)

March 29, 1993

William J. Cahill, Jr.
Group Vice President

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
MANUAL OR AUTOMATIC ACTUATION OF ANY ENGINEERED
SAFETY FEATURE
LICENSEE EVENT REPORT 93-03-00

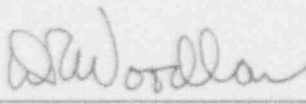
Gentlemen:

Enclosed is Licensee Event Report (LER) 93-03-00 for Comanche Peak Steam
Electric Station Unit 1, "Actuation of Unit 1 Train A Solid State Safeguards
Sequencer."

Sincerely,

William J. Cahill, Jr.

By:


D. R. Woodlan
Docket Licensing Manager

JET:bm

Enclosure

cc: Mr. J. L. Milhoan, Region IV
Mr. L. A. Yandell, Region IV
Resident Inspectors, CPSES (2)

9304010077 930329
PDR ADOCK 05000445
S PDR

JE22

NRC FORM 388		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
LICENSEE EVENT REPORT (LER)				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC, 20585, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC, 20503.	
Facility Name (1) COMANCHE PEAK-UNIT 1				DocId Number (2) 05000445	Page (3) 1 of 105
Title (4) ACTUATION OF UNIT 1 TRAIN A SOLID STATE SAFEGUARDS SEQUENCER					
Event Date (5)		ER Number (6)		Report Date (7)	
Month	Day	Year	Year	Sequence Number	Revision Number
02	26	93	93	003	00
Operating Mode (8) 1		This report is submitted pursuant to the requirements of 10 CFR 43.61 (Check one or more of the following) (11)			
Power Level (10) 100	20.405(b)		20.405(c)		<input checked="" type="checkbox"/> 30.73(a)(2)(iv)
	20.405(a)(1)(i)		30.36(c)(1)		<input type="checkbox"/> 30.73(a)(2)(v)
	20.405(a)(1)(ii)		30.36(c)(2)		<input type="checkbox"/> 30.73(a)(2)(vi)
	20.405(a)(1)(iii)		30.73(a)(2)(i)		<input type="checkbox"/> 30.73(a)(2)(vii)(A)
	20.405(a)(1)(iv)		30.73(a)(2)(ii)		<input type="checkbox"/> 30.73(a)(2)(vii)(B)
	20.405(a)(1)(v)		30.73(a)(2)(iii)		<input type="checkbox"/> 30.73(a)(2)(viii)
Licensee Contact For This LER (12)					
Name D. J. REIMER, MANAGER, SYSTEM ENGINEERING				Area Code 817	Telephone Number 897-5584
Complete One Line For Each Component Failure Described In This Report (13)					
Cause	System	Component	Manufacturer	Reportable To NRC	
				Y	
Supplemental Report Expected (14)					
<input type="checkbox"/> Yes (If yes, complete Expected Submission Date)				<input checked="" type="checkbox"/> No	
Expected Submission Date (15)				Month	Day
Abstract (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)					
<p>At 1005 p.m. on February 26, 1993, Comanche Peak Steam Electric Station Unit 1 was operating at 100 percent of rated thermal power. A spurious Safety Injection Signal (SIS) actuation from the Train A Solid State Safeguards Sequencer (SSSS) (referred to as Sequencer herein) occurred. All systems responded as designed. A suspected faulty card was replaced in the Train A Sequencer and the cabinet was re-energized. Another spurious SIS from the Train A Sequencer occurred upon restoration of power to the Sequencer. The Train A Sequencer card chassis was replaced including the removal of a logic monitoring instrument that was in place on the Train A Sequencer to troubleshoot an intermittent fault in the Train A Sequencer auto test circuit. The Train A Sequencer was then successfully tested and returned to service. The root cause of the event was failure of the instrument used during troubleshooting. The corrective action taken was to remove the failed test instrument from service.</p>					

NRC FORM 396A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED ONE NO. 3180-0104 EXPIRES: 4/30/96	
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC, 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3180-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC, 20503.	
Facility Name (1)	Docu# Number (2)	LER Number (3)		Page (2)	
COMANCHE PEAK-UNIT 1	05000445	Year	Sequential NUMBER	Revision NUMBER	
		93	- 003	- 000	02 of 05

Text (If more space is required, use additional NRC Form 396Aa) (17)

I. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

An event or condition that resulted in an automatic actuation of the Engineered Safety Feature (ESF)(EIS: JG)

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On February 26, 1993, Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 1, Power Operation, with the reactor operating at 100 percent of rated thermal power.

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

There were no inoperable structures, systems or components that contributed directly to the event.

D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROXIMATE TIMES

Prior to the event, a logic monitoring instrument had been connected to the Unit 1 Train A Solid State Safeguards Sequencer to identify an intermittent problem in the actuation circuit. The logic monitoring instrument was constructed specifically to detect an intermittent fault in the Sequencer high speed auto test circuitry. Functionality of the monitoring instrumentation had been verified and the monitor was installed in accordance with an approved troubleshooting plan. The test instrument monitored the logic circuit signals to isolate the source of the fault. This included the Sequencer circuit test point for SI Signal initiation.

At 2205 on February 26, 1993, the Train A Sequencer actuated a one out of six Safety Injection Signal (SIS) with no Safety Injection signal input present. The Sequencer was de-energized and a suspected faulted circuit card replaced. The system power was restored and a two out of six SIS immediately actuated. The Train A Emergency Diesel Generator started and the South Vent Stack Radiation Monitor tripped.

The Train A Sequencer card chassis was replaced. During the replacement, the monitoring device previously installed was removed. The Sequencer tested satisfactory with the replacement chassis at 0355 on February 27, 1993. The Train A Sequencer was declared operable and returned to service.

NRC FORM 308A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/20/92	
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 80.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMEN BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC, 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC, 20503.	
Facility Name (1)	DocId: Number (2)	LER Number (3)		Page (2)	
COMANCHE PEAK-UNIT 1	05000445	Year	Sequence Number	Revision Number	
		93	- 003	- 00	03 of 05

Text (If more space is required, use additional NRC Form 308A's) (17)

Any event or condition that results in an automatic actuation of any Engineered Safety Feature (ESF) is reportable within 4 hours under 10CFR50.72(b)(11). At approximately 0021 CST on February 27, 1993, the Nuclear Regulatory Commission Operations Center was notified via the Emergency Notification System of the event as required. At approximately 0030 CST on February 27, 1993 the Nuclear Regulatory Commission Operation Center was notified via the Emergency Notification System of the second actuation as required.

E. THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE, OR PROCEDURAL OR PERSONNEL ERROR

At 2205 on February 26, 1993, the Control Room Heating, Venting and Air Conditioning (HVAC) unit, UPS HVAC unit, and unit 1 electrical area Supply and Exhaust fans started. The Train A Sequencer indicated a one out of six SI actuation.

Post event analysis determined that the monitoring device had failed at the four points monitoring the Solid State Safeguards Sequencer logic circuits, resulting in the initial one out of six SI Signal and subsequent two out of six SI Signal.

II. COMPONENT OR SYSTEM FAILURES

A. FAILURE MODE, MECHANISM, AND EFFECT OF EACH FAILED COMPONENT

Failure of test equipment connected to the SI Sequencer for troubleshooting resulted in a spurious SIS actuation within the Sequencer. The monitoring instrument was connected at several test points along the Sequencer actuation and auto test circuit. The failure of the monitoring device placed these points at logic ground. A logic ground condition in the actuation circuitry resulted in the processing of a Train A Sequencer signal.

B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

The test equipment used to monitor the Sequencer sustained multiple integrated failures. The cause of the failures was not determined.

C. SYSTEMS OR SECONDARY FUNCTIONS THAT WERE AFFECTED BY FAILURE OF COMPONENTS WITH MULTIPLE FUNCTIONS

Train A Solid State Safeguards Sequencer

NRC Form 200A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92							
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 90.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.							
Facility Name (1)		Docket Number (2)		LER Number (6)							
COMANCHE PEAK-UNIT 1		05000445		<table border="1"> <tr> <td>Year</td> <td>Sequential Number</td> <td>Revision Number</td> </tr> <tr> <td>93</td> <td>003</td> <td>000</td> </tr> </table>		Year	Sequential Number	Revision Number	93	003	000
Year	Sequential Number	Revision Number									
93	003	000									
				Page (3) 4 of 05							

Text (if more space is required, use additional NRC Form 200A's) (17)

D. FAILED COMPONENT INFORMATION

Sylvania CMOS Circuit Chip
Model # ECG4042B

III. ANALYSIS OF THE EVENT**A. SAFETY SYSTEM RESPONSES THAT OCCURRED**

The following safety systems actuated automatically as a result of the event. The appropriate components within these systems operated as designed, upon receipt of the start signal from the Train A Solid State Safeguards Systems Sequencer.

Control Room Heating, Venting and Air Conditioning (EISS:VI)
UPS Heating, Venting and Air Conditioning (EISS:VI)
Electrical Area Supply and Exhaust fans (EISS:VF)
Train A Emergency Diesel Generator (EISS:EK)
South Vent Stack Radiation Monitor (EISS:IL)

B. DURATION OF SAFETY SYSTEM Train INOPERABILITY

The Train A Sequencer was inoperable for 5 hour and 50 minutes.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The SIS Sequencer protects the core during a loss of coolant accident (LOCA) by providing the logic to load the 6.9 kv bus in a pre-established time sequence. The SIS Sequencer actuation was the result of equipment failure and was not required to mitigate the consequences of an actual event.

The event on February 26, 1993 occurred at 100 percent reactor power and all protective functions responded as required. It is concluded that the event posed no threat to the safe operation of the plant or to the health and safety of the public. The event was bounded by the accident analysis described in the FSAR.

IV. CAUSE OF THE EVENT

Monitoring equipment connected to the Solid State Safeguards Systems Sequencer failed.

NRC FORM 388A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMEN BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC. 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC. 20503.	
Facility Name (1)	Docket Number (2)	LER Number (3)		Page (3)	
COMANCHE PEAK-UNIT 1	05000445	Year	Sequential Number	Revision Number	
		93	-003	-00	05 of 05

Text (If more space is required, use additional NRC Form 388A's) (17)

V. CORRECTIVE ACTION

Removal of monitoring device and replacement of the system card chassis. The logic monitoring instrument was constructed specifically for use in the Sequencer and is not used elsewhere at CPSES.

VI. PREVIOUS SIMILAR EVENTS

Although there have been several previous events of inadvertent actuation, the root causes of those events were unrelated to the root cause of this event. The corrective action taken to resolve the root causes of the previous events would not have prevented this event.