

TU ELECTRIC

Log # TXX-92446  
File # 10119  
# 909.5

September 18, 1992

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)  
DOCKET NOS. 50-445 AND 50-446  
NRC BULLETIN 92-01, SUPPLEMENT 1:  
FAILURE OF THERMO-LAG 330 FIRE BARRIER SYSTEM  
TO PERFORM ITS SPECIFIED FIRE ENDURANCE FUNCTION

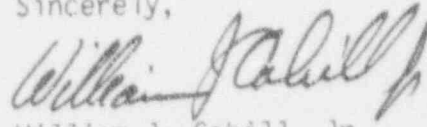
- REF: 1) NRC Bulletin 92-01: Failure of Thermo-Lag 330  
Fire Barrier System to maintain cabling in wide  
cable trays and small conduits free from fire damage
- 2) TU Electric letter logged TXX-92331 from  
William J. Cahill, Jr. to NRC dated July 9, 1992.

Gentlemen:

TU Electric has evaluated the issues identified in the subject bulletin, and has concluded that reference 2 adequately addresses the issues/concerns identified in the subject bulletin.

Reference 2 and this letter satisfy the requested actions. Should you require additional information or have any other questions please contact Obaid Bhatti at (817) 897-5839.

Sincerely,

  
William J. Cahill, Jr.

OB/tg

Attachments

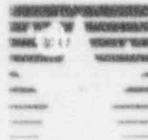
- c - Mr. J. L. Milhoan, Region IV  
Mr. T. A. Bergman, NRR  
Mr. B. E. Holian, NRR  
Resident Inspectors, CPSES (2)

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400 N. Olive Street L.B. 81 Dallas, Texas 75201

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Log # TXX-92331  
File # 10119  
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TU ELECTRIC

July 9, 1992

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)  
DOCKET NOS. 50-445 AND 50-446  
NRC BULLETIN 92-01: FAILURE OF THERMO-LAG  
330 FIRE BARRIER SYSTEM TO MAINTAIN CABLING  
IN WIDE CABLE TRAYS AND SMALL CONDUITS FREE  
FROM FIRE DAMAGE

REF: 1) TU Electric letter logged TXX-92325 from  
W. J. Cahill, Jr. to NRC dated July 2, 1992.

Gentlemen:

TU Electric has evaluated the concerns of the subject bulletin. The requested actions specified in the bulletin and the corresponding TU Electric responses for Unit 1 and Unit 2 are presented below.

Requested Action 1

For those plants that use either 1- or 3-hour pre-formed Thermo-Lag 330 panels and conduit shapes, identify the areas of the plant which have Thermo-Lag 330 fire barrier material installed and determine the plant areas which use this material for protecting either small diameter conduit or wide trays (widths greater than 14 inches) that provide safe shutdown capability.

TU Electric Response

Identification of the plant electrical raceways which have Thermo-Lag 330 fire barrier material installed to provide safe shutdown capability for Unit 1, were identified prior to implementation of the testing program described in the bulletin.

Requested Action 2

In those plant areas in which Thermo-Lag fire barriers are used to protect wide cable trays, small conduits, or both, the licensee should implement, in accordance with plant procedures, the appropriate compensatory measures,

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such as fire watches, consistent with those which would be implemented by either the plant technical specifications or the operating license for an inoperable fire barrier.

TU Electric Response

As identified in Licensee Event Report (LER)-92-011-00 (Ref. 1), and the voluntary report made via the Emergency Notification System, CPSES has implemented fire watches as compensatory measures in accordance with the Fire Protection program. Rooms that contain firesafe shutdown small diameter conduits or wide cable trays, which are protected by Thermo-Lag, are included in the fire watch coverage.

Requested Action 3

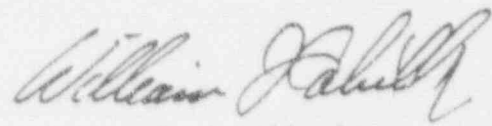
Each licensee, within 30 days of receiving this bulletin, is required to provide a written notification stating whether it has or does not have Thermo-Lag 330 fire barrier systems installed in its facilities. Each licensee who has installed Thermo-Lag 330 fire barriers is required to inform the NRC, in writing, whether it has taken the above actions and is required to describe the measures being taken to ensure or restore fire barrier operability.

TU Electric Response

Reference 1 and this letter satisfy the requested action.

Should you require additional information or have any other questions contact Obaid Bhatti at (817) 897-5839.

Sincerely,

  
William J. Cahill, Jr.

OB/tg  
Attachments

c - Mr. J. L. Milhoan, Region IV  
Mr. T. A. Bergman, NRR  
Mr. B. E. Holian, NRR  
Resident Inspectors, CPSES (2)

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of

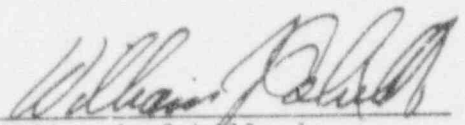
Texas Utilities Electric Company

(Comanche Peak Steam Electric  
Station, Units 1 & 2

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}  
Docket Nos. 50-445  
50-446

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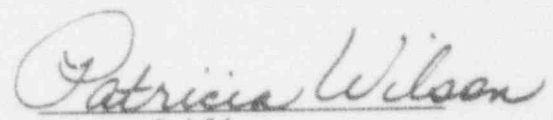
William J. Cahill, Jr. being duly sworn, hereby deposes and says that he is Group Vice President, Nuclear of TU Electric, that he is duly authorized to sign and file with the Nuclear Regulatory Commission this response to NRC Bulletin 92-01; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

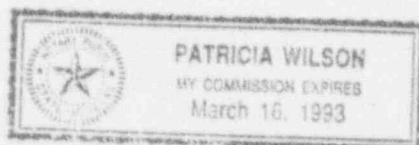
  
William J. Cahill, Jr.  
Group Vice President, Nuclear

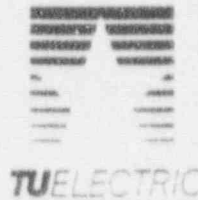
STATE OF TEXAS }

COUNTY OF SOMERVELL }

Subscribed and sworn to before me, a Notary Public, on this 9th day of  
July, 1992.

  
Notary Public





Log # TXX-92325  
File # 10200  
910.4  
Ref. Voluntary

July 2, 1992

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)  
DOCKET NO. 50-445  
REPORT OF EVENT WITH GENERIC INTEREST  
LICENSEE EVENT REPORT 92-011-00

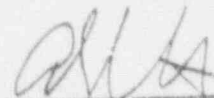
Gentlemen:

Enclosed is Licensee Event Report 92-011-00 for Comanche Peak Steam Electric Station Unit 1, "Failure of Thermo-Lag Fire Barrier Endurance Test Results In Some Raceways Declared Inoperable".

Sincerely,

William J. Cahill, Jr.

By:

  
A. B. Scott, Jr.  
Vice President Nuclear  
Operations

OB/tg

Enclosure

c - Mr. R. D. Martin, Region IV  
Resident Inspectors, CPSES (2)

Enclosure to TXX-92325

NRC FORM 100										U.S. NUCLEAR REGULATORY COMMISSION										APPROVED OMB NO. 3150-0106 EXPIRES 4/30/92																																																	
<b>LICENSEE EVENT REPORT (LER)</b>																														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, 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0106), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC, 20503.																																							
Facility Name (1)																				Comanche Peak-UNIT 1										DocId Number (2)										0150000445										Page (3)										1 of 106									
FAILURE OF THERMO-LAG FIRE BARRIER ENDURANCE TESTS RESULTS IN SOME RACEWAYS DECLARED INOPERABLE																																																																					
Event Date (5)										Report Number (6)										Report Date (7)										Other Facilities Involved (8)																																							
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06189292										011										00070292										N/A																																							
Operating Mode (9)										1										Report is submitted pursuant to the requirements of 10 CFR 50.103 (Check one or more of the following) (11)										DocId Number																																							
Power Level (10)										100										20.402(b)										20.405(c)										50.73(a)(2)(iv)										73.71(b)																			
																				20.405(a)(1)(i)										50.36(c)(1)										50.73(a)(2)(iv)										73.71(c)																			
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Licensee Contact For The LER (12)																																																																					
D. E. BUSCHBAUM, COMPLIANCE SUPERVISOR																																																																					
Area Code Telephone Number																																																																					
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Complete One Line For Each Component Failure Described in This Report (13)																																																																					
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Yes (If yes, complete Expected Submission Date) No																																																																					
Abstract (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																																																																					
<p>A fire endurance testing program was established to qualify Thermo-Lag 330 electrical raceway fire barrier systems for Comanche Peak Steam Electric Station (CPSES). The testing consisted of a series of 1-hour fire endurance tests on a variety of cable tray and conduit mock-up test specimens. Test failures occurred on small conduit and wide cable trays. The conclusion was that some Thermo-Lag fire barrier configurations do not provide the level of safety as required by the CPSES Fire Protection Plan.</p> <p>The root cause of the fire barrier material failure was inadequate vendor installation specifications and procedures. Fire watch routes were adjusted to cover the affected areas per the CPSES Fire Protection Plan. Additional tests will be performed. These tests will include modification techniques to increase the Thermo-Lag thickness on small conduits and enhance the structural integrity of Thermo-Lag installed on wide cable trays. Modifications of installed Thermo-Lag configurations on small conduits and wide cable trays will be implemented based on the results of these tests. This Licensee Event Report is submitted as a voluntary report.</p>																																																																					

Enclosure to TXX-92325

NRC FORM 366A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
<b>LICENSEE EVENT REPORT (LER)</b> <b>TEXT CONTINUATION</b>				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, 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC, 20503.	
ACTIVITY NAME (1)	DOCUMENT NUMBER (2)	LER NUMBER (3)		PAGE (3)	
COMANCHE PEAK-UNIT 1	015101010445	92	-	0111	-
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					OF 016

**I. DESCRIPTION OF THE REPORTABLE EVENT**

**A. REPORTABLE EVENT CLASSIFICATION**

This Licensee Event Report is submitted as a voluntary report.

**B. PLANT CONDITIONS PRIOR TO THE EVENT**

On June 18, 1992, Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 1, Power Operation, with the reactor at approximately 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 to the event.

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

A fire endurance testing program was established to qualify Thermo-Lag 330 electrical raceway fire barrier systems (EIS:(ISL)(FA)) for CPSES. This testing was in response to Nuclear Regulatory Commission (NRC) Information Notice 91-47 and 91-79. These Information Notices described problems with Thermo-Lag 330 fire barrier systems and associated failures. The testing was performed during the weeks of June 15 and June 22, 1992 at an independent laboratory.

The testing consisted of a series of 1-hour fire endurance tests on a variety of cable tray (EIS:(TY)(FA)) and conduit (EIS:(CND)(FA)) mock-up test specimens. The test specimens were constructed by plant personnel (utility, non-licensed) using stock material to give an accurate representation of the existing plant configuration. The fire barrier systems for the test specimens were constructed using pre-formed, 1-hour Thermo-Lag 330 panels and conduit shapes. The fire barrier systems were installed using CPSES installation procedures.

Enclosure to TXX-92325

NRC FORM 365A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
<b>LICENSEE EVENT REPORT (LER)</b> <b>TEXT CONTINUATION</b>				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, 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC, 20529.	
Facility Name (1)		DocId: NRC-1121		LER Number (6)	
COMANCHE PEAK-UNIT 1		05000445		92-011-0003 of 06	
<small>If more space is required, use additional NRC Form 365A's (17)</small>					

On June 17, 1992, a 1-hour fire endurance test was conducted on a test specimen that consisted of 3/4-, 1-, and 5-inch conduit entering and exiting a junction box. Circuit continuity was monitored during the test, with no recorded loss of circuit integrity. Temperatures were recorded on the 3/4-inch and 1-inch conduit and the junction box which exceeded the 325 degree F threshold described by Generic Letter 86-10, whereby analysis would be required to justify elevated cable temperatures. Cable jacket and some insulation deterioration was found on the cables inside the 3/4-inch and 1-inch conduits.

On June 18, 1992, a 1-hour fire endurance test was performed on a 12-inch wide cable tray test specimen. The temperatures throughout the test were below the 325 degree F threshold and no visible evidence of cable deterioration was found. This test was, therefore, successful.

On June 19, 1992, a 1-hour fire endurance test was conducted on a 30-inch ladder back cable tray test specimen. At 17 minutes into the test, the Thermo-Lag beams separated across the bottom. At 18 minutes, a joint between a tray support and the tray showed signs of weakening and separation. At 25 minutes, internal temperatures inside the cable tray exceeded 325 degrees F. The joint fully separated at 41 minutes and circuit integrity was lost. The test was considered, therefore, a failure. It should be noted that the 30-inch vertical runs did not appear to be affected; however, the test was terminated prior to determining acceptability.

As a result of the initial test, the condition was reported to the CPSES Unit 1 Shift Supervisor (utility, licensed) at 1430, June 18, 1992. Fire watch routes were adjusted to cover the affected areas per the CPSES Fire Protection Program by 1500, June 18, 1992. A voluntary report was made via the Emergency Notification System at 0139 on June 20, 1992, pending further fire endurance test results and evaluation.

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

Discovery was made during Thermo-Lag fire endurance tests conducted at OMEGA Point Labs, San Antonio, Texas.

Enclosure to TXX-92325

NRC FORM 356A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
<b>LICENSEE EVENT REPORT (LER)</b> <b>TEXT CONTINUATION</b>				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, 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC, 20503.	
Facility Name (1)		Docu# Number (2)		LER Number (3)	
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## II. COMPONENT OR SYSTEM FAILURES

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

Elevated temperatures on cables installed in conduit test specimen was due to thermal degradation of Thermo-Lag material during fire test conditions. This failure resulted in cable insulation deterioration. Failure of the Thermo-Lag material on the 30-inch cable tray test specimen was due to loss of structural integrity during fire test conditions. Failures were to test specimens during 1-hour fire endurance tests.

### B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

Circuit failure on the 30-inch cable tray test specimen occurred due to structural integrity failure of the Thermo-Lag fire barrier system. Failure occurred to a test specimen during 1-hour fire endurance test.

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

Not applicable - this event was the failure of test specimens in 1-hour fire endurance tests and did not involve actual plant components.

### D. FAILED COMPONENT INFORMATION

Thermo-Lag 330 fire barrier system  
Thermal Science, Inc.

## III. ANALYSIS OF THE EVENT

### A. SAFETY SYSTEM RESPONSES THAT OCCURRED

Not applicable - this event was the failure of test specimens in 1-hour fire endurance tests and did not involve plant components or systems.

### B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

Not applicable - this event was the failure of test specimens in 1-hour fire endurance tests and did not involve plant components.

Enclosure to TXX-92325

NRC FORM 355A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
<b>LICENSEE EVENT REPORT (LER)</b> <b>TEXT CONTINUATION</b>				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, 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	015101014145	912	-	0111	- 0101015
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### C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

CPSES is required to have a fire protection plan that satisfies 10CFR50 Appendix A, General Design Criteria 3, "Fire Protection." This design criteria requires structures, systems, and components important to safety be designed and located to minimize, in a manner consistent with other safety requirements, the probability and effects of fires and explosions. The CPSES Fire Protection Plan requires that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control stations to be free from fire damage. In accordance with the Plan, the separation of safe shutdown trains is ensured by separation of cables and equipment and associated circuits of redundant trains by a fire barrier having a 3-hour rating or the enclosure of cable, equipment, and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition to providing the 1-hour barrier, fire detection and automatic fire suppression systems are installed in designated fire areas.

The fire endurance testing program that was established to qualify Thermo-Lag 330 fire barrier systems was in response to NRC Information Notice 91-47 and 91-79 which described problems with the Thermo-Lag 330 fire barrier system. The testing failures on small conduit and wide cable trays has demonstrated that they do not provide the level of safety as required by the CPSES Fire Protection Plan. Under fire conditions, the failure of an electrical raceway fire barrier system, such as the Thermo-Lag system, could lead to both trains of safe shutdown systems being damaged by fire. This may affect the plant's ability to achieve and maintain shutdown conditions.

Compensatory measures, such as a fire watches, along with the low probability of an undetected fire of sufficient intensity and location to damage both trains of equipment, ensures that the continued safe operation of CPSES Unit 1 and the health and safety of the public are not adversely affected.

### IV. CAUSE OF THE EVENT

Inadequate performance of the fire barrier material when installed in accordance with the vendor's published installation specifications and procedures.

Enclosure to TXX-92325

NRC FORM 308A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
<b>LICENSEE EVENT REPORT (LER)</b> <b>TEXT CONTINUATION</b>				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, 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC, 20503.	
Facility Name (1)		License Number (2)		LER Number (3)	
COMANCHE PEAK-UNIT 1		05000445		92-011-0006 OF 06	
Year		Sequential Number		Revision Number	
92		011		000	

Text if more space is required, use additional NRC Form 308A (11/7)

## V. CORRECTIVE ACTIONS

- A. CPSES is using fire watches as compensatory measures in accordance with the Fire Protection Program. All rooms that contain fire-safe shutdown conduits or cable trays, of all sizes and protected by Thermo-Lag, are included in the fire watch coverage.
- B. Additional tests will be performed. These tests will include modification/upgrade techniques to increase the Thermo-Lag thickness on small conduits and enhance the structural integrity of Thermo-Lag installed on wide cable trays.
- C. Based on the results of the additional testing described above, modification/upgrade of installed Thermo-Lag configurations on small conduits and wide cable trays will be implemented to provide the level of protection required by the CPSES Fire Protection Plan as applicable.

## VI. PREVIOUS SIMILAR EVENTS

There have been no previous similar events at CPSES.

## VII. ADDITIONAL INFORMATION

This report satisfies the reporting requirements of 10CFR21 and 10CFR50.55e for CPSES Unit 2. The times listed in the report are approximate and Central Daylight Time.