

# The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

April 13, 1995  
ST-HL-AE-5016  
File No.: G09.07  
10CFR50 App R

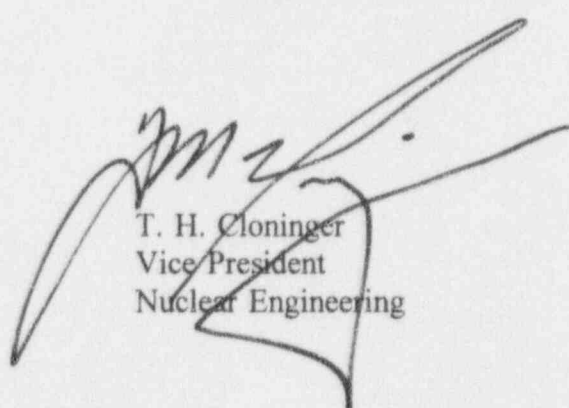
U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555-0001

South Texas Project  
Units 1 and 2  
Docket Nos. STN 50-498, STN 50-499  
Request for Deviation from 10CFR 50, Appendix R

Reference: Correspondence from R.P. Zimmerman to W.T. Cottle, dated September 19, 1994  
(ST-AE-HL-93938)

In accordance with the referenced letter, Houston Lighting & Power hereby requests a plant-specific deviation from our commitment to certain technical requirements of Appendix R to 10CFR50. Attached with this letter is a technical basis that demonstrates the in-plant condition provides an adequate level of fire safety and that the fire protection defense-in-depth is appropriately maintained.

If there are any questions regarding this request, please contact Mr. Ken Taplett at (512) 972-8416 or me at (512) 972-8787.



T. H. Cloninger  
Vice President  
Nuclear Engineering

JTC/lf

Attachment: Request for Deviation from Commitment to 10CFR50 Appendix R, Section III.G.2.c

9504190148 950413  
PDR ADOCK 05000498  
P PDR

MISC-95/95-088.001

Project Manager on Behalf of the Participants in the South Texas Project



c:

Leonard J. Callan  
Regional Administrator, Region IV  
U. S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 400  
Arlington, TX 76011-8064

Thomas W. Alexion  
Project Manager  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001 13H15

David P. Loveless  
Sr. Resident Inspector  
c/o U. S. Nuclear Regulatory Comm.  
P. O. Box 910  
Bay City, TX 77404-0910

J. R. Newman, Esquire  
Morgan, Lewis & Bockius  
1800 M Street, N.W.  
Washington, DC 20036-5869

K. J. Fiedler/M. T. Hardt  
City Public Service  
P. O. Box 1771  
San Antonio, TX 78296

J. C. Lanier/M. B. Lee  
City of Austin  
Electric Utility Department  
721 Barton Springs Road  
Austin, TX 78704

C. A. Johnson  
Central Power and Light Company  
P. O. Box 289, Mail Code: N5012  
Wadsworth, TX 77483

Rufus S. Scott  
Associate General Counsel  
Houston Lighting & Power Company  
P. O. Box 61067  
Houston, TX 77208

Institute of Nuclear Power  
Operations - Records Center  
700 Galleria Parkway  
Atlanta, GA 30339-5957

Dr. Joseph M. Hendrie  
50 Bellport Lane  
Bellport, NY 11713

Richard A. Ratliff  
Bureau of Radiation Control  
Texas Department of Health  
1100 West 49th Street  
Austin, TX 78756-3189

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

J. R. Egan, Esquire  
Egan & Associates, P.C.  
2300 N Street, N.W.  
Washington, D.C. 20037

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )

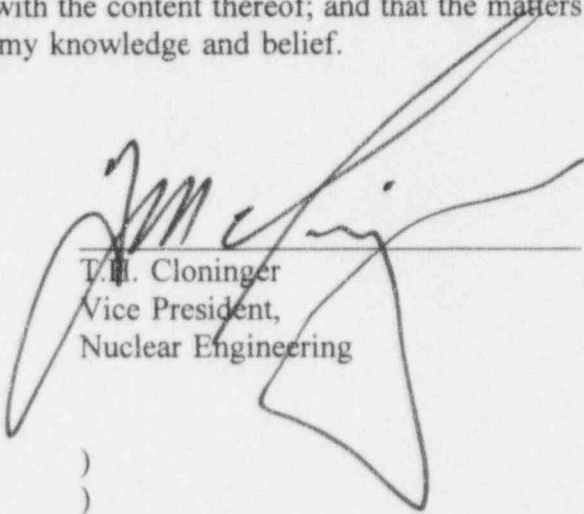
Houston Lighting & Power )  
Company, et al., )

Docket Nos. 50-498  
50-499

South Texas Project )  
Units 1 and 2 )

AFFIDAVIT

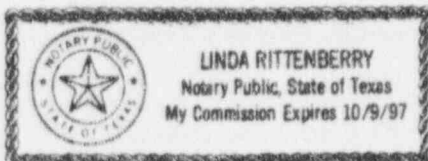
I, T. H. Cloninger, being duly sworn, hereby depose and state that I am Vice President, Nuclear Engineering, of Houston Lighting & Power Company; that I am duly authorized to sign and file with the Nuclear Regulatory Commission the attached request for deviation from 10CFR50 Appendix R; that I am familiar with the content thereof; and that the matters set forth therein are true and correct to the best of my knowledge and belief.

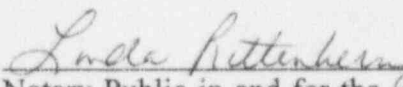
  
T.H. Cloninger  
Vice President,  
Nuclear Engineering

STATE OF TEXAS )

COUNTY OF MATAGORDA )

Subscribed and sworn to before me, a Notary Public in and for the State of Texas, this 13<sup>th</sup> day of April, 1995.



  
Notary Public in and for the  
State of Texas

**REQUEST FOR DEVIATION FROM COMMITMENT TO  
10 CFR 50 APPENDIX R, SECTION III.G.2.c  
FOR LACK OF SUPPRESSION IN FIRE AREA 7**

**SOUTH TEXAS PROJECT  
UNITS 1 AND 2**

**REQUEST FOR DEVIATION FROM COMMITMENT TO  
10 CFR 50 APPENDIX R, SECTION III.G.2.c  
FOR LACK OF SUPPRESSION IN FIRE AREA 07**

**SOUTH TEXAS PROJECT  
UNITS 1 AND 2**

**I. PURPOSE**

This evaluation provides the basis for a deviation from Houston Lighting & Power's commitment to the requirements of 10 CFR 50, Appendix R, Section III.G.2.c. The deviation is for Fire Area 07 in the Auxiliary Shutdown Area of the Mechanical and Electrical Auxiliary Building (MEAB) elevation 10 feet. Safe shutdown cabling in this area is protected by a 3-hour configuration of Thermo-Lag 330-1 which has recently been re-evaluated to qualify for a fire rating of 1-hour. The Auxiliary Shutdown Area currently contains an area-wide ionization fire detection system in the vicinity of the Thermo-Lag 330-1 of concern in Fire Area 07 of the MEAB. This area is not provided with automatic fire suppression systems, therefore, the requirements of Appendix R, Section III.G.2.c are not fully satisfied.

**II. DISCUSSION**

Recent fire endurance testing by the Nuclear Energy Institute indicates that the qualification of the 3-hour rated Thermo-Lag 330-1 configurations will require significant upgrades and may not be feasible. An alternative to 3-hour rating qualification of the existing Thermo-Lag 330-1 is the downgrading of the Thermo-Lag 330-1 fire barrier rating to a 1-hour rating.

A review of the Fire Hazards Analysis indicates that Fire Area 07 in the MEAB, in which 3-hour rated Thermo-Lag 330-1 is credited, is provided with ionization detection capability. The ionization detection system provides area wide coverage and, therefore, satisfies the requirements for Appendix R, Section III.G.2.c with respect to fire detection. However, an automatic suppression system is not provided.

A summary of the fire area configuration including the fire hazards located in the area is provided below.

## **Fire Area Configuration**

### **General Fire Area Description**

Fire Area 07 is composed of Fire Zone Z071 which is the Auxiliary Shutdown area on the 10 foot elevation. The walls, floor and ceiling are 3-hour rated fire barriers. Doors and penetrations in the barriers are constructed such that their ratings are equivalent with that of the barrier. Ventilation duct penetrations in fire barriers are provided with 3-hour rated dampers. The fire dampers installed in the HVAC duct systems serving the Qualified Display Processing System were not installed per the manufacturer's instructions, in that they were not installed in concrete wall. This condition was previously addressed in the Fire Hazards Analysis in a Deviation from BTP APCSB 9.5-1 Appendix A or 10CFR50 Appendix R with respective justification. Smoke and heat removal are accomplished with portable exhaust fans and flexible ductwork. Drains are provided for firewater removal in the adjacent hallway.

### **Safe Shutdown Equipment in the Area**

For safe shutdown cable/components (with and without Thermo-Lag 330-1) located in Fire Area 07 refer to the STP Fire Hazards Analysis Report, Table 2-2 and 5A011MC6023, Appendix R Analyses.

### **In-Situ Combustible Loading**

The following in-situ combustibles are located on the elevation of concern:

•	Class A:	2,000 lbs
•	Class B:	3,150 lbs
•	PVC:	Negligible amount
•	Combustible Load:	40,000 Btu/ft <sup>2</sup> ( Area: 950 ft <sup>2</sup> )

### **Assumed Transient Combustible Loading**

Transient Combustibles are limited in this area by procedure 0PGP03-ZF-0004, Control Of Transient Fire Loads, and by procedure 0PGP03-0006, Control Of Ignition Sources. These procedures virtually eliminate additional transient combustible loading in this area and control ignition sources to limit fire potential from transient conditions.



## **Ignition Source/Combustible Material Walkdown Results**

### **Ignition Sources**

Per the Fire Induced Vulnerability Evaluation (FIVE) methodology, ignition sources were identified as electrical cabinets, several junction/pull boxes and a computer source. Walkdowns of Fire Area 07 found these ignition sources within 20 feet of the Thermo-Lag 330-1 raceways.

### **Combustibles**

Walkdowns of Fire Area 07 found the following combustibles that did not screen per the FIVE methodology: two bookshelves containing several 3-ring binders with approximately 50 lb. of paper (400,000 BTU), a computer terminal and three additional electrical cabinets each conservatively assumed to be 58,500 BTU per terminal or panel.

### **Fire Detection**

Area wide ionization smoke detectors are located in Fire Area 07.

### **Fire Suppression**

#### **Automatic**

No automatic fire suppression systems are provided.

#### **Manual**

Manual fire suppression is provided by hose cabinets and portable extinguishers located in the corridor just outside the entrance to the room.

The Fire Brigade drill records, for fires in the general area of Fire Area 07, indicate the area can be reached within 10 minutes. This rapid response from the Fire Brigade will provide for early suppression of a fire in this area.

## **III. EVALUATION**

The fire detection system in Fire Area 07 of the MEAB provides area wide detection for this room containing credited 3-hour rated Thermo-Lag 330-1. Therefore, the installed detection system meets the requirements of Appendix R, Section III.G.2.c.

The fire area summary provided above identifies the ignition sources and combustibles (with the exception of cables) within 20 feet of the Thermo-Lag 330-1 raceways of concern. The majority of in-situ cable insulation is located in covered trays. However, some in-situ cable insulation is located in open cable trays in the vicinity of the raceways.

Fire detection actuation would also ensure rapid response (within 10 minutes) by the Fire Brigade, thus further ensuring that a fire will be rapidly controlled and suppressed.

To investigate the effect of a fire on the Thermo-Lag 330-1 raceways, a number of FIVE models were developed. The methodology for development of these FIVE models identified five creditable ignition sources for each Unit to be evaluated:

#### Unit 1

- Auxiliary Shutdown Panel (5Z351ZLP100)
- QDPS Train D Cabinets (4Z551ZLP680)
- QDPS Train D Cabinets (4Z551ZLP680-1)
- Computer Terminal
- Bookshelves (Transient Combustible)

#### Unit 2

- Auxiliary Shutdown Panel (5Z352ZLP100)
- QDPS Train D Cabinets (4Z552ZLP680)
- QDPS Train D Cabinets (4Z552ZLP680-1)
- Computer Terminal
- Bookshelves (Transient Combustible)

Each of the above ignition sources located in the Units 1 and 2 Auxiliary Shutdown Area was evaluated using the FIVE fire modeling techniques. In all scenarios evaluated, the critical damage temperature of the target, safe shutdown cabling, was not approached. Each ignition source was modeled by Ceiling Jet Damage Analysis and Plume Damage Analysis. These models each contained several conservatisms and assumptions that show that the actual fire damage potential in these areas is very low. The principal conservatism involves the use of 700°F as the damage temperature for the targets. This effectively analyzes for damage without taking into account any protection provided by the Thermo-Lag 330-1 material covering the protected cables. It was concluded based on these fire models that the Thermo-Lag 330-1 protected safe shutdown cables in Fire Area 07 will remain free from fire damage.



#### IV. CONCLUSIONS

The existing area wide ionization detection system, in conjunction with the qualification of the credited Thermo-Lag 330-1 barriers to a fire rating of at least 1-hour, will protect the Thermo-Lag 330-1 safe shutdown cables against the hazards in the area. The configuration of ignition sources and combustibles, both in-situ and transient, as discussed above will not present a significant hazard to the Thermo-Lag 330-1 raceways. A fire model ( FIVE) representative of the most credible fire in the area has demonstrated that the Thermo-Lag 330-1 enclosures, in conjunction with the area-wide detection system, are adequate to protect the safe shutdown circuits from the hazards in the area.

#### V. REFERENCES

1. 10 CFR 50 Appendix R, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979
2. Generic Letter 86-10, Implementation of Fire Protection Requirements
3. EPRI TR-100370, Fire-Induced Vulnerability Evaluation (FIVE), April 1992
4. ASTM E-119, Fire Tests of Building Construction and Materials
5. STPEGS Procedure 0PG03-ZF-0006, Revision 5, "Control of Ignitions Sources"
6. STPEGS Procedure 0PGP03-ZF-0004, Revision 1, "Control of Transient Fire Loads"
7. STPEGS Calculation Number 7Q270MC5800, Revision 6, "Combustible Loading of Safety Related Areas"
8. STPEGS Fire Hazards Analysis Report, Amendment 9
9. 5A011MC6023, Appendix R Evaluation, Revision 6, with amendments
10. 0023-00177-RPT-001, Fire Modeling Analysis of STP Auxiliary Shutdown Area, Revision 0
11. 0025-00177-RPT-002, Thermo-Lag Assessment Report, Revision 0
12. STPEGS Updated Final Safety Analysis Report, Section 9.5.1.1