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SUBJECT: Provides closeout documentation Harris Nuclear Plant re GL 92-08, "Thermo-Lag 330-1 Fire Barriers." Plant will restore Thermo-Lag Barrier configurations to svc & discontinue compensatory actions accordingly.

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NOTES: Application for permit renewal filed. 05000400

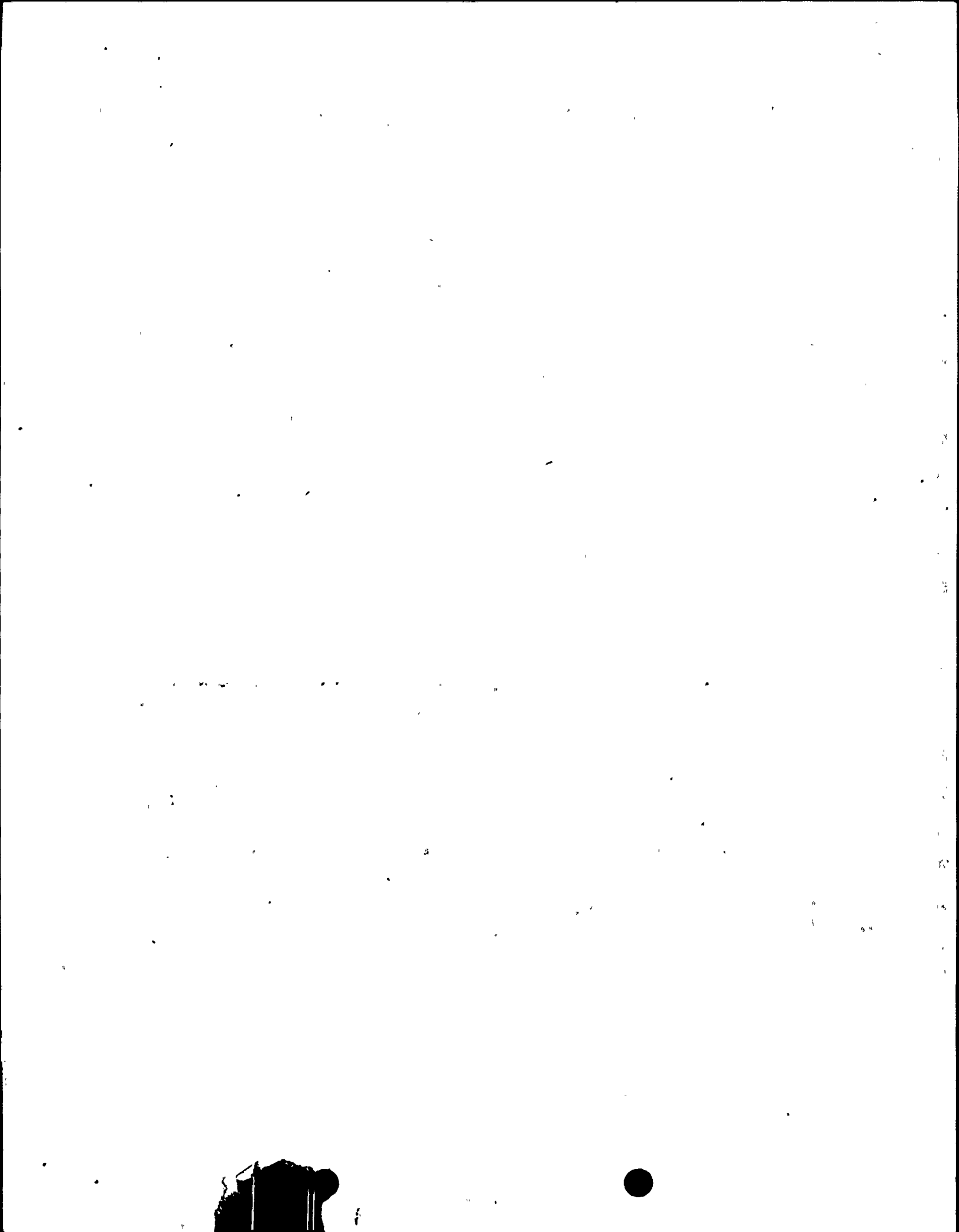
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Carolina Power & Light Company
PO Box 165
New Hill NC 27562

William R. Robinson
Vice President
Harris Nuclear Plant

AUG 29 1997

SERIAL: HNP-97-170
10 CFR 50.54(f)

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555-0001

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
CLOSEOUT DOCUMENTATION REGARDING
NRC GENERIC LETTER 92-08, "THERMO-LAG 330-1 FIRE BARRIERS"

Dear Sir or Madam:

Pursuant to 10 CFR 50.54(f), Carolina Power & Light Company (CP&L) hereby provides closeout documentation for the Harris Nuclear Plant (HNP) regarding Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers." By letter dated May 16, 1997, CP&L provided a status of Thermo-Lag resolution at HNP. Enclosure 1 of the May 16, 1997 letter described the Thermo-Lag resolution activities which had been completed and identified three remaining work activities. These remaining items have now been completed and this letter provides a revised Enclosure 1 which summarizes the completed Thermo-Lag resolution activities. Enclosure 2 provides details of HNP actions completed in response to the NRC Request for Additional Information regarding Generic Letter 92-08.

In accordance with the commitment contained in HNP letter, (Serial: NLS-93-101), dated April 16, 1993, this letter serves as written notification of our intent to restore Thermo-Lag Fire Barrier configurations to service and discontinue compensatory actions accordingly.

Questions regarding this matter may be referred to Mr. J. H. Eads at (919) 362-2646.

Sincerely,

William R. Robinson

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JHE/jhe
Enclosures

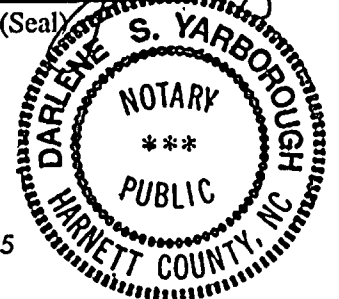
W. R. Robinson, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are employees, contractors, and agents of Carolina Power & Light Company.

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PDR ADDCK 05000400
P PDR

Darlene S. Yarbrough
Notary (Seal)

My commission expires: *2-6-2000*

- c: Mr. J. B. Brady, NRC Sr. Resident Inspector
- Mr. V. L. Rooney, NRC Project Manager
- Mr. L. A. Reyes, NRC Regional Administrator



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HNP-97-170 / Page 2

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ENCLOSURE 1
THERMO-LAG RESOLUTION ACTIVITIES

The following is a brief summary of completed Thermo-Lag resolution activities for the Harris Nuclear Plant (HNP).

1. Three full scale fire tests of the plant configurations were performed independent of the NEI generic fire testing program. These fire tests were performed in 1994 and 1995. Engineering evaluations have been completed to document the acceptance of this testing against the as-found conditions of the fire barrier including the completion of a 10 CFR 50.59 safety evaluation (see Attachment 2) which determined the barrier enclosures are adequate for the hazard.
2. Chemical testing was completed on Thermo-Lag samples in 1996 as part of NEI's generic chemical testing program.
3. Design changes were developed in 1996 to upgrade penetration sleeves located in fire wall and ceiling configurations. These upgrades were developed based on actual fire test configurations. Field installation of these upgrades began in 1996 and were completed in August 1997. This activity included corrective actions for recently identified fire barrier deficiencies (LER 97-006).
4. The one-hour partial height fire wall configuration in the Reactor Auxiliary Building was redesigned in 1996 and the Thermo-Lag material was removed and replaced with an alternate material in April 1997.
5. Engineering evaluations were started in 1995 and completed in August 1997 addressing Thermo-Lag material thickness, use of Thermo-Lag on fire door transoms, revisions to combustible loading calculations to reflect the combustibility of Thermo-Lag, ampacity derating evaluations and revisions to the safe shutdown analysis to reduce dependence on Thermo-Lag protection.
6. A design change was developed in 1996 to reroute safe shutdown cables (source range cable) to eliminate the need for existing Thermo-Lag protection. This reroute was completed prior to Refueling Outage Number 7 (RFO-7).
7. A design change was developed in 1996 to reroute safe shutdown cables (cables for pressurizer and reactor head vent valves) to eliminate the need for the existing Thermo-Lag protection. This design change also specified removal of Thermo-Lag material associated with conduits protected with Thermo-Lag. A small portion of Thermo-Lag material associated with these conduits could not be removed due to physical accessibility restrictions. Analyses to support the retention of this material (including evaluation of cable ampacity derating, combustible loadings, and seismic requirements) were completed. Implementation of this design change was completed during the RFO-7 outage.



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8. A review of the seismic requirements for Thermo-Lag installations was started in 1995 which included a field walkdown of the installed configurations to determine interactions with safety related components. An engineering evaluation of these interactions was completed in May 1996 and a site specific seismic test was also performed in July 1996 to envelope several configurations that required additional test data to support acceptance of their installations. The engineering evaluations associated with the seismic reviews and testing were completed in February 1997.

9. A determination of the Quality Attributes necessary to support future procurement of required Thermo-Lag material was started in 1996 and completed in March 1997.

ENCLOSURE 2
HNP ACTIONS COMPLETED IN RESPONSE TO
NRC REQUEST FOR ADDITIONAL INFORMATION

1. Thermo-Lag Materials

NRC Request:

1.a. Describe the specific tests and analyses that will be performed to verify that the Thermo-Lag fire barrier materials that are currently installed at the Shearon Harris Nuclear Power Plant, Unit 1 (SHNPP), or that will be installed in the future, are representative of the materials that were used to address the technical issues associated with thermo-lag barriers and to construct the fire endurance and ampacity derating test specimens. The tests and analyses shall address the material properties and attributes that were determined or controlled by TSI during the manufacturing process and the quality assurance program. The tests and analyses shall also address the material properties and attributes that contribute to conclusions that the Thermo-Lag materials and barriers conform to NRC regulations. These include:

- (1) chemical composition
- (2) material thickness
- (3) material weight and density
- (4) the presence of voids, cracks, and delaminations
- (5) fire endurance capabilities
- (6) combustibility
- (7) flame spread rating
- (8) ampacity derating
- (9) mechanical properties such as tensile strength, compressive strength, shear strength, and flexural strength.

HNP Response:

The scope of Thermo-Lag 330-1 material used at HNP and covered by this response includes the following:

- A fire area enclosure located in the Cable Spreading Rooms and a fire area enclosure located in the Auxiliary Control Panel room,
- A partial height fire wall located in the Reactor Auxiliary Building (wall subsequently reconstructed without Thermo-Lag),
- Fire door transoms and mullion fire proofing protection, and
- Conduit protection (Thermo-Lag conduit protection will no longer be credited as a fire barrier based on rerouting of several safe shutdown cables and crediting alternate safe shutdown components. The alternate component evaluation was completed in April 1997 and the cable reroute

modifications, including removal of thermo-lag material where possible, were completed prior to the completion of RFO-7).

Future installations of Thermo-Lag to support repairs or upgrades will be performed in accordance with the CP&L Quality Assurance Program for Fire Protection Systems. Quality attributes have been developed from industry test results which can be utilized by HNP during receipt inspections to verify acceptability of the Thermo-Lag material.

(1) Chemical Composition

Status: Complete

Comments: HNP participated in NEI chemical testing program. The chemical testing results are described in HNP letter dated July 12, 1996 (HNP-96-112).

(2) Material Thickness

Status: Complete

Comments: HNP performed thickness measurements in accordance with the guidance provided in ASTM E605-93 for the area enclosures. Fire door transoms and mullions were evaluated per Generic Letter 86-10.

(3) Material Weight and Density

Status: Complete

Comments: HNP participated in NEI chemical testing program and no additional material property testing was identified.

(4) Presence of Voids, Cracks, and Delaminations

Status: Complete

Comments: Material subject to voids, cracks, and delaminations used on conduits is no longer credited as a fire barrier at HNP. Other applications of thermo-lag (flat panels and trowel grade material) used at HNP are not subject to this concern.

(5) Fire Endurance Capabilities

Status: Complete

Comments: Testing complete; however, additional analyses of the area enclosures and penetration reevaluation and/or upgrades were required. Additional analyses required for the evaluation of the Thermo-Lag area enclosures were completed in August 1997. Reevaluation and/or upgrades of twenty-eight barrier penetrations were completed in August 1997. This activity included corrective actions for recently identified fire barrier deficiencies (LER 97-006). In addition, fire door transoms and mullions were evaluated per Generic Letter 86-10.

(6) Combustibility

Status: Complete

Comments: HNP utilized the information contained in the NEI combustibility evaluation guideline. No plant specific combustibility testing was performed. Applicable area combustible loading calculations have been revised to include thermo-lag as a combustible material.

(7) Flame Spread Rating

Status: Complete

Comments: HNP utilized the information contained in the NEI combustibility evaluation guideline. No plant specific flame spread rate testing was performed.

(8) Ampacity Derating

Status: Complete

Comments: Ampacity derating evaluations have been completed. No plant modifications were required.

(9) Mechanical Properties such as Tensile Strength, Compressive Strength, Shear Strength, and Flexural Strength.

Status: Complete

Comments: Seismic evaluations (2 over 1) have been completed. Seismic testing of wall configurations has been performed where warranted.

The combination of seismic evaluations and seismic tests demonstrated adequacy. No seismic modifications were required.

NRC Request:

- 1.b. Describe the methodology that will be used to determine the sample size and demonstrate that the sample size will be large enough to ensure that the information and data obtained will be sufficient to assess the total population of in-plant Thermo-Lag barriers and the materials that will be installed in the future. In determining the sample size, consider the time of installation and manufacture of the various in-plant materials and barrier installations. Give the number and types (e.g., panels, conduit preshapes, trowel-grade material, stress skin) of samples that will be tested or analyzed.

HNP Response:

Status: Complete

Comments: HNP participated in the NEI chemical testing program. The chemical testing sample size for HNP was described in HNP letter dated July 12, 1996 (HNP-96-112). Sample size for material thickness evaluations for area enclosures was performed in accordance with the guidance provided in ASTM E605-93.

NRC Request:

- 1.c. Submit the schedule for verifying the Thermo-Lag materials.

HNP Response:

Status: Complete

Comments: This letter provides the overall closeout documentation for the resolution of Thermo-Lag issues at HNP.

NRC Request:

- 1.d. After analyses and tests have been completed, submit a written supplemental report that confirms that this effort has been completed and provide the results of the tests and analyses. Describe any changes to previously submitted plans or schedules that result from the tests or analyses.

HNP Response:

Status: Complete

Comments: The HNP response to 1.d was submitted to the NRC by letter dated July 12, 1996.

2. Important Barrier Parameters

NRC Request:

- 2.a. Describe the examinations and inspection that will be performed to obtain the important barrier parameters given in Section II of the RAI of December 1993 for the Thermo-Lag fire barrier configurations installed at SHNPP.

HNP Response:

Status: Complete

Comments: HNP has completed joint utility fire endurance testing; however, additional analyses of the area enclosures and penetration reevaluation and/or upgrades were required. As stated in response to question 1.a.(5), additional analyses of the area enclosures were completed in August 1997. Reevaluation and/or upgrades of twenty-eight barrier penetrations were completed in August 1997. This activity included corrective actions for recently identified fire barrier deficiencies (LER 97-006). In addition, fire door transoms and mullions were evaluated per Generic Letter 86-10.

NRC Request:

- 2.b. Describe the methodology that will be applied to determine the number and type of representative in-plant fire barrier configurations that will be examined in detail and demonstrate that the sample size is adequate to ensure that the information and data that will be obtained are adequate to assess the total population of in-plant Thermo-Lag barriers. A large enough sample of the total population of configurations should be examined to provide reasonable assurance that the materials and important barriers parameters used to construct the in-plant barriers and any future barrier installations or modifications, are representative of the parameters used to construct the fire endurance test specimens.

HNP Response:

Status: Complete

Comments: HNP participated in the NEI chemical testing program. The chemical testing sample size for HNP was described in HNP letter dated July 12, 1996 (HNP-96-112). Sample size for material thickness evaluations was performed in accordance with the guidance provided in ASTM E605-93.

NRC Request:

- 2.c. Submit the schedule for obtaining and verifying all the important barrier parameters.

HNP Response:

Status: Complete

Comments: This letter provides the overall closeout documentation for the resolution of Thermo-Lag issues at HNP.

NRC Request:

- 2.d. After information has been obtained and verified, submit a written supplemental report that confirms that this effort has been completed and provides the results of the examinations and inspections. Verify that the parameters of the in-plant configurations are representative of the parameters of the fire endurance test specimens. Describe any changes to previously submitted plans or schedules that result from the examinations.

HNP Response:

Status: Complete

Comments: This letter provides the overall closeout documentation for the resolution of Thermo-Lag issues at HNP. The following attachments provide the documentation of the results of the examinations and inspections of the Thermo-Lag barriers at HNP. As required by the NRC, additional information and documentation concerning Thermo-Lag resolution at HNP has been retained on-site and is available for review during future NRC audits or inspections.

Attachment 1 Fire endurance test summaries

Attachment 2 10 CFR 50.59 Safety Evaluation on Thermo-Lag Enclosures installed in the Cable Spreading Rooms and Auxiliary Control Panel Room.

ATTACHMENT 1
FIRE ENDURANCE TEST SUMMARIES

- 1) Fire Endurance Test No. 14980-97261 dated November 7, 1994
- 2) Fire Endurance Test No. 14980-97668 dated May 18, 1995
- 3) Fire Endurance Test No. 14980-98207 dated May 23, 1995

