From: Joseph Lenahan, R2
To: Gerald Wiseman, R2
Date: 7/25/02 11:41AM
Subject: 95001 Inspection of Harris Fire Protection Finding (Rpt # 400/02-08)

Attached for your review is my inspection report for the White finding. Note that I state the finding will remain open pending further NRC review of the manual operator actions aspects of their corrective actions. I left a copy of Revision 0 of EC 48802 on your desk which specifies the licensee's corrective actions. The green tabs mark pages which discuss the safe shutdown and manual operator actions. Note there are statements in the EC that the EC will remain open pending NRC approval. The red tabs mark pages containing these statements. George MacDonald will call John Caves, Harris Licensing, next week to discuss meaning of these statements and determine whether CP&L plans to make a submittal to NRR for approval of changes to their fire protection program.

I will be at Oconee next week. Telephone # in our conference room is 864-885-3334.

CC: Charlie Payne; James Moorman; Robert Schin

H 15

DRAFT

on the license provided Additional info

Carolina Power & Light Company
ATTN: Mr. James Scarola
Vice President - Harris Plant
Shearon Harris Nuclear Power Plant
P. O. Box 165, Mail Code: Zone 1
New Hill, NC 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC SUPPLEMENTAL INSPECTION REPORT 50-400/02-08

Dear Mr. Scarola:

On May 31, 2002, the Nuclear Regulatory Commission (NRC) completed a supplemental inspection at your Shearon Harris Nuclear Power Plant. The enclosed report documents the inspection findings which were discussed on May 31, 2002, with you and other members of your staff.

This supplemental inspection was an examination of your problem identification, root cause evaluation, extent of condition determination, and corrective actions associated withy a White finding identified in the mitigating system cornerstone. The White finding involved a violation of your fire protection program resulting from a Thermo-Lag fire barrier assembly which had an indeterminate fire resistance rating.

Based on the results of the inspection, the NRC determined that your corrective actions (both planned and already completed) are appropriate to resolve the deficiency in your fire protection program concerning the Thermo-lag barrier which did not comply with 10 CFR 50, Appendix R requirements. However the White finding will remain open pending further review of the credit for manual operator actions to achieve safe-shutdown in the event of a fire in the new ACP room fire area.

For administrative purposes, a Severity Level III violation associated with the Thermo-Lag fire barrier assembly between the B train switchgear room/auxiliary control panel room and the A train cable spreading room which was previously dispositioned in NRC's letter dated April 16, 2002, is identified in the enclosed report.

No findings of significance were identified during the inspection.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publically Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

Charles D. Payne, Acting Chief
Engineering Branch 1
Division of Reactor Safety

Docket No.: 50-400
License No.: NPF-63

Enclosure: Inspection Report No. 50-400/02-08
w/Attachment

OFFICE	RII:DRS	RII:DRS	RII:DRP	RII:DRS	RII:DRS	RII:DRS	RII:DRS
SIGNATURE							
NAME	LENAHAN	WISEMAN	BONSER				
DATE	7/ /2002						7/ /2002
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME:

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No:	50-400
License No:	NPF-63
Report No:	50-400/2002-08
Licensee:	Carolina Power & Light (CP&L)
Facility:	Shearon Harris Nuclear Power Plant, Unit 1
Location:	5413 Shearon Harris Road New Hill, NC 27562
Dates:	May 29 - 31, 2002
Inspectors:	J. Lenahan, Senior Reactor Inspector
Approved By:	Charles D. Payne, Acting Chief Engineering Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000400-02-08 on 5/29 - 31/02, Carolina Power and Light Company, Shearon Harris Nuclear Plant, Unit 1: Supplemental inspection to assess licensee's evaluation of Thermo-lag fire barrier with indeterminate fire resistance rating.

This inspection was conducted by regional inspectors. A White finding, which was previously dispositioned in an NRC letter dated April 16, 2002, is identified in this report for administrative purposes. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://nrr10.nrc.gov/NRR/OVERSIGHT/index.html.

Cornerstone: Mitigating Systems

This supplemental inspection was performed in accordance with Inspection Procedure 95001 to assess the licensee's evaluation associated with the Thermo-lag fire barrier separating Train A and Train B safety related cables in the auxiliary control panel (ACP) room. The thermo-lag barrier provided a fire resistance of 1 hour 48 minutes instead of the minimum 3 hour fire resistance rating required by 10 CFR 50, Appendix R regulations. This performance issue was identified by NRC during a fire protection inspection in November, 1999 which was initially documented in NRC Inspection Report number 50-400/99-13. Final disposition of this issue was summarized in an NRC letter dated April 16, 2002, was characterized in the increased regulatory response (White) band. The inspectors determined that the licensee's problem identification, root cause and extent of condition evaluation were adequate. The licensee's corrective actions to resolve the issues were ongoing and appeared to be adequate. However the White finding will remain open pending further review of the credit for manual operator actions to achieve safe-shutdown in the event of a fire in the new ACP room fire area.

Findings

White. A violation of the fire protection program required by 10 CFR 50.48 and License Condition 2.F was identified in an NRC letter dated April 16, 2002. The violation was for failure to implement the NRC approved fire protection program safe shutdown system separation requirements by maintaining a three-hour fire rated area separation barrier between the B Train switchgear room/auxiliary control panel room and the A train cable spreading room. The existing Thermo-lag barrier had an indeterminate fire resistance rating.

This finding was preliminarily characterized as a White issue (i. e. an issue with low to moderate increased importance to safety) in a letter to the licensee dated December 18, 2001, Subject NRC Inspection Report Number 50-400/00-09; Preliminary White Finding. Two apparent violations were identified in the December 18, 2001 letter. In a letter

dated March 18, 2002, Subject: NRC Inspection Report NO. 50-400/00-09; Revised Risk Assessment, the licensee was informed that NRC revised the risk assessment for the issue based on additional information provided by the licensee. However the issue was still determined to be consistent with a White finding. The results of the NRC's final significance determination for the degraded fire barrier was documented in an NRC letter to CP&L dated April 16, 2002, Subject: Final Significance Determination For a White Finding and Notice of Violation (Shearon Harris Nuclear Power Plant - NRC Inspection Report 50-400/00-09). Both apparent violations identified in the December 18, 2001 letter were combined into one NOV (Section 4OA5.1).

Harris Nuclear Plant, Unit 1
NRC Inspection Report 50-400/02-08

Report Details

01 Inspection Scope

This supplemental inspection was performed using Inspection Procedure 95001, Inspection for One or Two White Findings, to assess the licensee's corrective actions associated with a White finding in their fire protection program. The inspection included a review of the licensee's problem identification, root cause and extent of condition evaluation, and corrective actions.

The inspectors assessed problem identification, the licensee's root cause and extent of condition evaluation, and the licensee's corrective actions to resolve the White finding in their fire protection program. The inspection included a review of design change documents, including design inputs, assumptions, and design evaluations, licensee self assessments, examination of in process plant modifications being performed on fire barriers, and a review of changes to operating procedures, fire protection procedures, and the safe shutdown analysis.

02. Evaluation of Inspection Requirements

02.01 Problem Identification

a. Determination of who identified the issue and under what conditions.

During the initial pilot fire protection inspection, which was conducted from November 1 - 5, 1999 and documented in NRC Inspection Report No. 50-400/99-13, two unresolved items (URIs) were identified were identified by NRC. One of the URIs concerned the adequacy of the thermal lag fire barrier which was designated as a three-hour fire barrier between the Train B switchgear room and Train A safety related cables in the auxiliary control panel (ACP) room. The potential problem with thermo-lag fire barrier material was identified to industry by the NRC in 1992 in Generic Letter (GL) 92-08 and NRC Bulletin 92-01. In response to NRC Bulletin 92-01 and GL 92-08, the licensee had accepted, through an engineering evaluation, that the as constructed thermal lag barrier met Appendix R requirements (3 hour barrier), even though testing showed the barrier only provided a 1 hour 48 minute fire barrier. The licensee initiated Problem Evaluation Report (PER) 99-006863 to document and disposition the URI identified in the pilot fire

protection inspection.

b. Determination of how long the issue existed, and prior opportunities for identification.

The degraded fire barrier was installed during original plant construction. Prior opportunities for identification were in response to NRC Bulletin 92-01 and GL 92-08. Licensee actions to address Generic Letter 92-08 resulted in the acceptance of an inadequate thermo-lag fire barrier in 1997 (ESR 95-00620, Thermo-lag Fire Protection Issues Resolution," Revision 1). There were several opportunities to find this problem. The final response to the Generic Letter provided the Harris final plan and included the safety evaluation for the modification. The 1998 triennial fire protection Nuclear Assessment Section audit inspected a sample of thermo-lag and included the required independent evaluation performed by a contractor. Self assessments of the fire protection program after 1997 also had the opportunity to find the problem. However, they were dominated by the individuals responsible for the thermo-lag evaluation.

c. Determination of the plant-specific risk consequences (as applicable) and compliance concerns associated with the issue.

The degraded fire barrier was evaluated for a fire in the B switchgear room that would engulf the room and cause the thermo-lag fire barrier in the auxiliary control panel area of the B switchgear room fire area to fail affecting the A train cables within the enclosed barrier area. The A train cables behind the thermo-lag wall affected the A train AFW function and A steam generator PORV functions. The assessment of the event performed by NRC concluded that this event was in the increased regulatory response (White) band. The results of the NRC's final significance determination for the degraded fire barrier was documented in an NRC letter to CP&L dated April 16, 2002, Subject: Final Significance Determination For a White Finding and Notice of Violation (Shearon Harris Nuclear Power Plant - NRC Inspection Report 50-400/00-09).

02.02 Root Cause and Extent of Condition Evaluation

a. Evaluation of methods used to identify root causes and contributing causes.

The licensee initiated a Significant Adverse Condition Report , Action Request number 53063, to evaluate and correct the problem. The evaluation was performed using the systematic methods specified in the licensee's corrective action program specified in CP&L procedure CAP-NGGC-0200. The licensee concluded that the root cause of the White finding was due to the inappropriate use of an analysis to accept changes to the NRC approved fire protection program. Contributing causes were inadequate testing of installed fire barriers, too much reliance on engineering evaluations, and failure to

address design requirements.

b. Level of detail of the root cause evaluation.

The inspectors determined that the root cause evaluation was sufficiently detailed to support the identified root and contributing causes. The root cause analysis did not identify why the inadequate fire testing of installed fire barrier occurred (root cause), or why there was too much reliance on GL 86-10 engineering evaluations (contributing cause), or why there was a failure to adequately address design requirements (contributing cause). However, licensee personnel pointed out that the most important factor was that fire ratings must be tied to acceptable fire qualification tests. An additional layer of why questions would lose the fundamental concept that fire barrier qualification must be tied to an acceptable test.

c. Consideration of prior occurrences of the problem and knowledge of prior operating experience.

The investigation identified 218 matches from the INPO database including Generic Letters, NRC Bulletins and Information Notices, and LERs related to similar Thermo-lag issues at various nuclear power plants. The root cause evaluation found that the method of resolution at HNP was unique to the others identified.

d. Consideration of potential common causes and extent of condition of the problem

In late 2000, NRC identified additional thermo lag fire barriers in the cable spreading rooms which also did not meet the requirements for three hour fire barriers. Since fire suppression systems (sprinklers) existed in most of these areas, the licensee was able to downgrade the barriers to a one hour fire rating and comply with Appendix R requirements. However some areas did not have sufficient coverage from the sprinklers and the licensee did not have sufficient test data/documentation to adequately demonstrate that some as-built thermo lag barrier configurations in the cable spreading room provided a one hour barrier. The licensee has a program to evaluate existing sprinkler coverage, install new sprinklers as required, and test the existing barrier configurations to show they will meet the one hour requirement. These corrective actions are scheduled to be completed by December, 2002. The licensee performed a detailed self-assessment to examine their overall fire protection program and compare their program to the regulatory requirements (Appendix R, UFSAR, SERs, etc.) The evaluation portion of the assessment has been completed. Numerous findings were identified. Examples of findings: Illegible UFSAR drawings, typos in the UFSAR, unclear statements in the UFSAR and SERs, errors in the UFSAR, eg location of hose station, and lack of test documentation to demonstrate the muntins (door frames) and transoms over fire doors meet Appendix R requirements. These findings are being reviewed to

determine how they will be resolved. The licensee plans to issue the self-assessment report in August, 2002.

02.03 Corrective Actions

a. Appropriateness of corrective action(s).

The inspector determined that the licensee's corrective actions were adequate to resolve the issue. Corrective actions to revise the fire area to eliminate the need for the thermo-lag barrier by upgrading an existing concrete wall to a 3 hour fire barrier. Design procedures were revised to emphasize the need to require adequate qualification testing to be performed prior to changing the approved fire protection program. However additional review will be performed by NRC of the licensee's credit for manual operator actions to achieve safe shutdown in some fire scenarios.

b. Prioritization of corrective actions.

The inspector concluded that the licensee's corrective actions were properly prioritized to address the risk. The changes to the ACP area were being worked concurrent with completion of the engineering change. The inspectors reviewed Engineering Change (EC) 48802 to upgrade an existing concrete wall between switchgear room B and the ACP room to a rated three hour fire barrier. This work included sealing the existing penetrations in the wall. However this will create a new fire zone, the ACP room. The licensee has revised their fire plans (AOP-036, Safe Shutdown Following a Fire) to address the new area. This plan includes manual operator actions to achieve safe shutdown in some fire scenarios.

c. Establishment of schedule for implementing and completing the corrective actions.

The inspector verified that the licensee's corrective action program identified assigned individuals, completion dates, and reference numbers to the licensee's corrective action tracking program to ensure that corrective actions completed in accordance with their priority. Procedure changes to ensure that review criteria exist to ensure that fire barrier modifications do not invalidate test results in the future was complete. Although the EC for the ACP room had not been issued, the field work had been performed at risk and was essentially completed prior to completion of the EC. Reviews of other fire barriers was in progress, and initial walkdowns were complete. Resolution of other fire protection issues were in progress and were being prioritized based on risk.

d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence.

The effectiveness of these measures will be determined through direct observation of the completed modifications and changes to the fire protection program. An effectiveness review was scheduled for July 2003.

The inspectors performed plant walkdowns and document reviews in determining that the extent of condition for the thermo-lag wall issue included all thermo-lag usage in the plant. The thermo-lag usage included various transoms and mullions on the 216', 236', 261', and 305' elevations of the reactor auxiliary building and control building; and Thermo-lag wall and tunnel assemblies in the A and B cable spreading rooms and the B switchgear room auxiliary control panel area. The problem with the thermo-lag issue was related to the use of engineering evaluations for determining the applicability of fire test results to qualify plant features as rated fire barriers. In the case of the thermo-lag, a failed 3 hour qualification fire test was used to accept thermo-lag features by engineering evaluation as adequate for the hazard. The use of failed tests for fire rating determination appears specific to the resolution of the thermo-lag issue. In other cases, hardware modifications were made to reconcile the configurations to the test configurations that passed rating tests. Upgrading the concrete wall between the B switchgear room and the ACP room to a 3 hour barrier decreases the risk of damaging the A train cables in the ACP room as a result of a fire in the B switchgear room.

4. OTHER ACTIVITIES

4OA5 Other

.1 (Closed) AV 50-400/00-09-01:Failure to Maintain the Fire Area Separation Barrier Between The B Train Switchgear Room/Auxiliary Control Panel Room and the A Train Cable Spreading Room as a 3-hour Rated Barrier

This apparent violation was identified to the licensee in a letter dated December 18, 2001, Subject: NRC Inspection Report 50-400/00-09; Preliminary White Finding. The apparent violation concerned the Thermo-Lag fire barrier assembly which the B train switchgear room and the A train cable spreading room. The results of testing performed by the licensee in 1994 and 1995 showed that the fire barrier did not have the required three-hour fire resistance rating. After reviewing the test results, the licensee changed the fire protection program by revising the rating of the fire barrier from three hours to that suitable for the hazard. This issue had been initially identified by NRC as unresolved item 50-400/99-13-01. In a letter dated April 16, 2002, Subject: Final Significance Determination For a White Finding and Notice of Violation (Shearon Harris Nuclear Power Plant - NRC Inspection Report 50-400/00-09), the licensee was informed that NRC had determined that this issue was a violation of License Condition 2F of the

Harris Operating License. A Notice of Violation, Severity Level III, was included as an Enclosure to the April 16, 2002 letter. For tracking purposes, this Severity Level III violation is identified as Violation (VIO) 50-400/02-08-01: Failure to Implement and Maintain NRC Approved Fire Protection Program Safe Shutdown System Separation Requirements. Apparent Violation 50-400/00-09-01 is closed.

(Closed) AV 50-400/00-09-02:Failure to Obtain NRC Approval Prior to Implementing a Change to the Approved Fire Protection Program

This apparent violation was also identified to the licensee in a letter dated December 18, 2001, Subject: NRC Inspection Report 50-400/00-09; Preliminary White Finding. This apparent violation concerned the fact that the licensee made changes to the approved fire protection program by accepting the degraded fire barrier, through an engineering evaluation, without prior Commission approval. This issue had been initially identified by NRC as unresolved item 50-400/99-13-02. In a letter dated April 16, 2002, Subject: Final Significance Determination For a White Finding and Notice of Violation (Shearon Harris Nuclear Power Plant - NRC Inspection Report 50-400/00-09), the licensee was informed that NRC had determined that it was appropriate to cite this issue as part of Violation (VIO) 50-400/02-08-o1: Failure to Implement and Maintain NRC Approved Fire Protection Program Safe Shutdown System Separation Requirements. Apparent Violation 50-400/00-09-02 is closed.

4OA6 Management Meetings

The inspector presented the inspection results to Mr. J. Scarola and other members of the licensee's staff at the conclusion of the inspection on May 31, 2002. The licensee acknowledged the findings presented. Proprietary information is not included in the inspection report.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Alexander, Manager, Nuclear Assessment Section
J. Caves, Supervisor, Licensing
M. Fletcher, Fire Protection System Engineer
C. Georgeson, Electrical Engineer
J. Holt, Site Support Services Manager
A. Khanpour, Superintendent of Design, Harris Engineering Support Services
D. McAfee, Fire Protection Program Manager
E. McCartney, Superintendent Of Technical Services, HESS
J. Scarola, Harris Plant Vice President
M. Wallace, Senior Analyst, Licensing

NRC

J. Brady, Senior Resident Inspector

ITEMS OPENED, CLOSED AND DISCUSSED

Opened During this Inspection

50-400/02-08-01	VIO	Failure to Implement and Maintain NRC Approved Fire Protection Program Safe Shutdown System Separation Requirements (Section 4OA5.1)

Previous Items Closed

50-400/00-09-01	AV	Failure to Maintain the Fire Area Separation Barrier Between The B Train Switchgear Room/Auxiliary Control Panel Room and the A Train Cable Spreading Room as a 3-hour Rated Barrier (Section 4OA5.1)
50-400/00-09-02	AV	Failure to Obtain NRC Approval Prior to Implementing a Change to the Approved Fire Protection Program(Section 4OA5.1)

LIST OF BASELINE INSPECTIONS PERFORMED

The following procedure was used to perform the inspection during the report period. Documented findings are contained in the body of the report.

IP 95001	Supplemental Inspection For One Or Two White Inputs In A Strategic Performance Area.

LIST OF DOCUMENTS REVIEWED

CP&L Procedure CAP-NGGC-200, Corrective Action Program, Rev. 4

Engineering Service Request 99-0180, Evaluation of Low Density Silicone Elastomer (LDSE) Seals, Rev. 0, 6/16/99

Engineering Change 48802, Make ACP Room Separate Fire Area, Revision 0, 7/17/02

DBD
Calculation E-5525, Safe Shutdown Analysis in Case of Fire, Rev. 5, 5/7/02, and pending changes resulting from EC 48802

Calculation E-5524, Safe Shutdown Analysis Changes to the Cable Function Report ans Essential Cable Analysis, Rev. 5, 6/2/02

Abnormal Operating Procedure AOP 036, Safe Shutdown Following A Fire, Rev. 19, and pending revisions resulting from EC 48802

Drawing Numbers SK-48802-C-1000, ACP Door Transom Detail, Sheets 1 and 2

Drawing Number SK-48802-C-1000, ACP Wall Penetrations, Sheet 1

Work Orders 233062 01 and 233062 02, Make ACP Room Separate Fire Area