



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

June 25, 1999

LICENSEE: Public Service Electric and Gas Company
FACILITIES: Salem Nuclear Generating Station, Unit Nos. 1 and 2
SUBJECT: SUMMARY OF MAY 27, 1999, MEETING REGARDING FIRE BARRIER WRAP PROJECT STATUS (TAC NOS. M98190 AND M98191)

This summary refers to the meeting with Public Service Electric and Gas Company (PSE&G or the licensee) conducted on May 27, 1999, at the U.S. Nuclear Regulatory Commission (NRC) office in Rockville, Maryland. The meeting was held at the request of the NRC staff to discuss the status of the fire barrier wrap project for the Salem Nuclear Generating Station, Unit Nos. 1 and 2. A list of the attendees at the meeting (Enclosure 1) and a copy of the slides presented by PSE&G are enclosed (Enclosure 2).

The PSE&G presentation closely followed the material in their slides provided at the meeting. The following major topics were discussed:

Salem Electrical Raceway Fire Barrier Project Status

The licensee gave a general discussion regarding the status of the various phases of the Salem Raceway Fire Barrier Wrap Project. With regard to Phase I - Analysis, the licensee indicated that the Safe Shutdown Re-Analysis for Salem Unit 2 was completed by the February 1999 commitment date and the analysis for Salem Unit 1 was currently on schedule for an October 1999 completion. The licensee noted that it has made some enhancements to the current safe shutdown methodology and that the Unit 2 analysis has resulted in a 36 percent reduction in the need to fire wrap. A similar reduction is also estimated for Unit 1. In addition to the re-analysis effort, the licensee has been conducting configuration walkdowns of fire barriers. Because no prior discrepancies were noted with the location of electrical cables during plant design modifications, the licensee will not be conducting configuration walkdowns in this area. The licensee is also testing the existing barrier materials and configurations and potential replacement fire barrier materials. Final selection of replacement materials will be completed by the end of the year.

Since some of the design changes may include the use of fire-resistant cables, the NRC staff stated that the licensee should hold further discussion with the staff on this subject prior to completing the designs. The licensee stated that barrier design work would begin early in the year 2000.

The NRC staff also requested that the licensee provide more detailed project schedules for the next project update meeting with the staff.

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Evaluation of Existing Fire Wrap Materials

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The licensee stated that the documentation on the installed configurations and correlation of current configuration to previous test data for the 3M E-50 material is complete for Salem Unit 2. Based on this information and additional testing, the licensee discussed the current material options that are being considered. However, no fire barrier material has been selected as yet.

Safe Shutdown Re-Analysis Documentation

Following the licensee's prepared remarks, the licensee provided a review of typical documents that have been prepared during the re-analysis. The licensee reviewed a typical safe shutdown flow path using the residual heat removal system as an example. The licensee noted that there were no basic changes from the prior logic although some additional components were added to offer added operator flexibility.

The NRC staff noted that during a periodic on-site review of the project, the project instructions were not clear and did not contain sufficient detail with regard to how the analysis was being performed. Also, there were project instructions that were not finished. The licensee committed to rewriting the project instructions, as needed, to improve the clarity and completeness.

The NRC staff concluded the discussions with a request that the licensee consider the usefulness of performing an independent assessment of the fire barrier modifications and process.

Original signed by:

Patrick D. Milano, Senior Project Manager, Section 2
 Project Directorate I
 Division of Licensing Project Management
 Office of Nuclear Reactor Regulation

Enclosures: 1. Attendance List
 2. PSE&G Slides
 Docket Nos. 50-272 and 50-311
 cc w/enclosures: See next page

DOCUMENT NAME: mts98190.wpd

OFFICE	PDI-2/PM	PDI-2/LA	SPLB/SC	PDI-2/SC	
NAME	PMilano	TClark	SWest	JClifford	
DATE	06/23 /99	06/21 /99	06/25 /99	06/25 /99	

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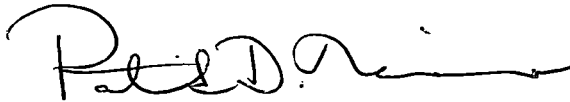
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Units 1 and 2

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Hancocks Bridge, NJ 08038

MEETING ATTENDANCE LIST

Licensee: Public Service Electric and Gas Company

Plant(s): Salem, Units 1 and 2

Subject: Fire Barrier Wrap Project Status

Date: May 27, 1999

Time: 10:00 a.m.

Location: NRC Offices, OWFN Room 1-F-5

<u>NRC STAFF</u>	<u>TITLE</u>	<u>ORGANIZATION</u>
J. Clifford	Section Chief	NRR/DLPM/PDI
P. Milano	Sr. Project Manager	NRR/DLPM/PDI
S. West	Section Chief	NRR/DSSA/SPLB
P. Madden	Sr. Fire Protection Engineer	NRR/DSSA/SPLB
A. Pal	Electrical Engineer	NRR/DET/EEIB
K. Young	Reactor Engineer	RGN-I/DRS/EEB

PSE&G

D. Powell	Director, Licensing and Regulatory Affairs
C. Smyth	Manager, Salem Licensing
A. Moudgil	Manager, Fire Wrap Project
K. Mathur	Project Engineer
D. Shumaker	Fire Protection Engineer

Duke Engineering and Services (PSE&G Contractor)

W. McDevitt	Senior Technical Specialist
J. Redmond	Project Manager

Public

D. Vann	Nuclear Engineer, State of New Jersey
P. Gunter	Nuclear Information and Resource Service
D. Lochbaum	Nuclear Safety Engineer, Union of Concerned Scientists
W. Kenworthy	Vice President, GSI Associates
M. Callahan	GSI Associates

The Power of Commitment



*Salem Electrical Raceway
Fire Barrier Project*

May 27, 1999

1

Enclosure 2

The Power of Commitment



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Agenda

- *Opening Remarks*
- *Project Objective, Scope, Status and Schedule*
- *Safe Shutdown Re-Analysis Activities*
- *Material Qualification Activities*
- *Replacement/Upgrade Material Assessment*
- *Concluding Remarks*

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Project Objective

Ensure the ability to safely shutdown the Salem Units in the event of fire and to bring the plant into compliance with the Fire Protection Rule.



■ *Defense in depth provides echelons of safety:*

- *Degraded ERFB's provide level of protection*
- *Control of combustibles and ignition sources*
- *Fire detection equipment*
- *Fire suppression equipment (CO₂, Halon, Sprinklers, Hose stations, sprinklers)*
- *Fire barriers to contain fires*
- *Dedicated on site fire brigade*

■ *Initiated Compensatory Measures*

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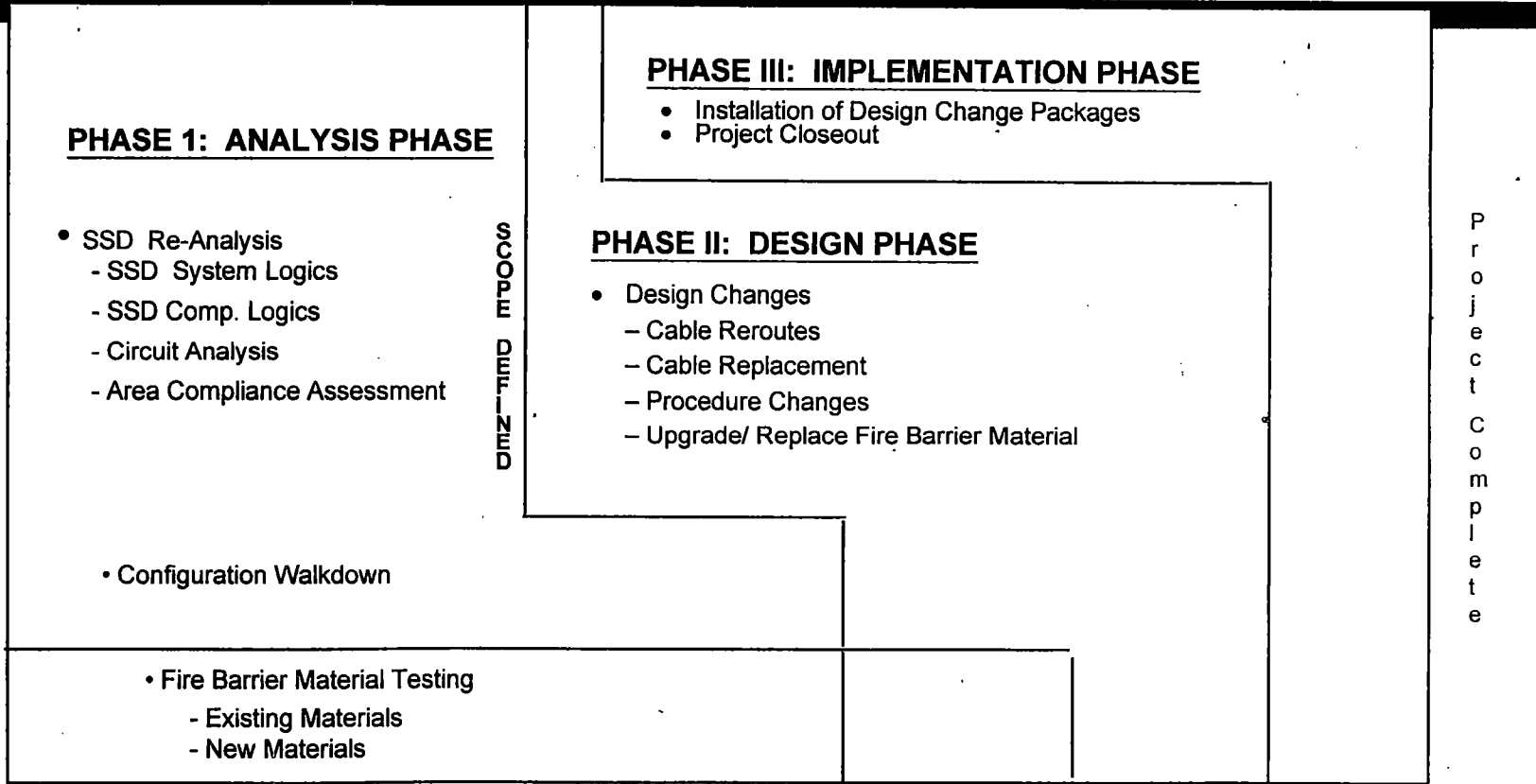
Project Strategies

■ *3 Project Phases*

- *Phase 1 - Review Plant Design*
 - *Optimize Safe Shutdown Analysis*
 - *Review Installed Configurations*
- *Phase 2 - Engineer Resolutions*
- *Phase 3 - Perform Modifications*



Project Schedule



<u>SSD Re-Analysis</u>	<u>Phase I</u>	<u>Phase 2</u>	<u>Phase 3</u>
2/99(U2) *	8/99(U2)	1/02(U2)	5/02(U2)*
10/99(U1)*	12/99(U1)	7/02(U1)	12/02(U1)*

* NRC Commitment: - SSD Re-Analysis 18 Months after Unit Restart
 - Project complete 3 Outages after Unit Restart



Safe Shutdown Re-analysis

Reassess the Salem Post Fire Safe Shutdown Analysis (SSD):

- *Prepared System Logic Diagram to define systems required to satisfy Appendix R Performance Goals.*
- *Prepared Component Logic Diagrams to determine components necessary to satisfy performance goals.*
 - *New components were added to the SSD analysis.*
- *Perform Circuit Analysis*
 - *Multiple spurious operations (“any and all one at a time”).*

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Safe Shutdown Re-analysis

- *Perform Compliance Assessment for fire areas where the wrap material is installed.*
- *Fire wrap reduction strategy (Unit 2)*
 - *deleting need to protect duplicate flow paths.*
 - *deleting need to protect certain diesel cables by crediting off-site power.*
 - *deleting need to protect 3-phase AC power cables.*
 - *deleting need to protect non-credited indication cables.*



Safe Shutdown Re-analysis

Manual Action Strategy:

- *Manual action was considered as a last resort.*
- *No new manual actions proposed to reduce existing wrap material.*
- *Manual actions will be evaluated for time line and feasibility.*



Safe Shutdown Re-analysis Status

- *Completed System and Component Logic Diagrams for Salem Unit 1 & 2.*
- *Completed SSD Fire Area Compliance Assessment for Unit 2.*
- *Unit 1 SSD Fire Area Compliance Assessment is progressing to complete Oct 1999 as scheduled.*
- *Manual Action timeline and feasibility study in progress.*
- *In-house and third party reviews have been performed with no major findings.*

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Material Qualification Activities

- *Walkdown and Document Configurations*
- *Review and Correlate Configurations to Tests*
- *Perform Additional Tests for Unbounded Configurations*



FS-195 Material Qualification Status

- *Identified Representative Installations*
- *Correlated installations to existing test*
- *Performed Baseline Test (GL 86-10 Suppl. 1)*
 - *Tested cable tray, conduit, and a junction box*
 - *FS-195 did not meet the one hour requirement*
 - *Testing limited to those required for RI/PB reviews*



3M E-50 Material Qualification Status

- *Identified Representative Installations*
- *Correlated Installations to Existing Tests*
- *Performed Baseline Test (GL 86-10 Suppl. 1)*
 - *Cable tray, conduit, air drop and junction box*
 - *Favorable results from conduits*
 - *Favorable results from air drop*
 - *Favorable results from junction boxes*
 - *Cable tray configurations were less than 1hr.*



3ME-50 Material Qualification Status

- *Documenting Installed Configurations*
 - *Unit 2 Completed*
 - *Unit 1 In Process*
- *Correlating Configurations to Existing Tests*
 - *Unit 2 Complete*
 - *Unit 1 In Process*
- *Preparing to Test Unbounded Configurations*
 - *May include configurations for RI/PB reviews*



- *Cable Re-routes*
- *Fire Resistant Cable Installations*
 - *Whitiker Cable*
 - *Rockbestos Firezone R*
- *Assess Defense in Depth Attributes and Risk Informed/Performance Based Options*
- *Where necessary, Upgrade/Replace Wrap*

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Basis for Material Selection

- *Fire Resistance Rating & Hose Stream*
- *Ampacity De-rating*
- *Structural /Seismic*
- *Material Properties*
 - *Offgas*
 - *Aging*
 - *Combustible Load*



Material Options Considered

FS-195

- *3M E-50 (G)*
- *Darmat KM-1 (T)*
- *FS-195 (X)*
- *Mecatiss (G)*
- *TCO-704 (X)*
- *Thermo-Lag 330 (X)*
- *Thermo-Lag 770 (T)*
- *Versa-Wrap (G)*

3M E-50

- *3M E-50 Overlay (G)*
- *TCO-704 Overlay (G)*

● *Notes:*

G=Positive test results

T=Test pending (scheduled)

X=Not currently considered

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Material Options Considered

Ventilated Options

- *3M G-Mat Vented System*
- *Darmat Vented System*
- *Mecatiss Vent (T)*
- *Promatec Composite Vent System (T)*

- *Notes:*

G=Positive test results

T=Test pending (scheduled)

X=Not currently considered



Conclusion

- *Plan to resolve issues is in place*
- *Plan is being implemented and achieving meaningful results*
- *Plan is on Schedule*
- *We will continue to provide status as the plan progresses*

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