



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 5, 1995

Docket
File

50-219

LICENSEE: GPU Nuclear Corporation

FACILITY: Oyster Creek Nuclear Generating Station

SUBJECT: SUMMARY OF AUGUST 30, 1995, MEETING REGARDING THERMO-LAG FIRE
BARRIERS INSTALLED AT THE OYSTER CREEK NUCLEAR GENERATING STATION

On Wednesday, August 30, 1995, a meeting was held at NRC Headquarters, One White Flint North, Rockville, Maryland, between GPU Nuclear Corporation (GPUN) and the NRC staff to discuss matters regarding Thermo-lag Fire Barriers installed at the Oyster Creek Nuclear Generating Station. Attachment 1 is the list of participants.

Attachment 2 is the licensee's agenda. The following is a summary of significant items discussed.

GPUN indicated that approximately 1055 feet of Thermo-lag was installed on conduits (includes radial bends, LBD's and junction boxes), 600 square feet of duct wrap and 315 square feet on 7 penetration boxes. The stairwell enclosure also has Thermo-lag but it is not required as a rated fire barrier.

There was a detailed discussion between GPUN and the staff regarding the 24 important barrier parameters stated in NRC letter dated December 21, 1993 (a list of these parameters is presented on pages 11 and 12 of Attachment 2). The licensee indicated that the material thickness and pre-buttering of joints were the key parameters requiring verification by QA verification records.

GPUN also discussed material and installation inspections of the Thermo-lag installed at Oyster Creek.

As a result of the detailed discussions, GPUN indicated that GPUN will update the Table of Important Barrier Parameters to reflect information discussed that was not addressed in the Table. The staff also requested that the licensee provide additional information regarding Barrier Parameters No. 9 "Baseline Fire Barrier Panel Thickness," No. 11 "Panel Rib Orientation," No. 13 "Stress Skin Orientation," No. 16 "Dry Fit, Post Buttered or Pre-Buttered," No. 17 "Joint GAP Width," No. 18 "Butt Joints or Grooved and Scored Joints," and No. 21 "Band Wire Distance to Joints" (see pages 11 and 12 of Attachment 2).

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September 5, 1995

The licensee indicated that GPUN will provide the additional information in their response to the staff's letter of August 22, 1995.

Original signed by:

Alexander W. Dromerick, Senior Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-219

Attachments: 1. List of Attendees
2. Meeting Agenda

cc w/atts: See next page

Distribution w/atts. 1 & 2:

Docket File
PUBLIC
PD I-3 Memo
JFRogge, RI
ADromerick

Distribution w/att. 1

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EConnell	CMcCracken
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DOCUMENT NAME: G:\DROMERIC\8-30.SUM

OFFICE	LA:PDI-3	PM:PDI-3	D:PD
NAME	SNorris	ADromerick:cn	PMcKee
DATE	08/31/95	08/31/95	08/31/95

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September 5, 1995

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Alexander W. Dromerick, Senior Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-219

Attachments: 1. List of Attendees
2. Meeting Agenda

cc w/atts: See next page

Oyster Creek Nuclear
Generating Station

cc:

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LIST OF ATTENDEES

MEETING WITH GPUM - AUGUST 30, 1995

THERMO-LAG OPEN ISSUES

NAME

AFFILIATION

Alex Dromerick	NRC/NRR/PDI-3 - Project Manager
John Fornicola	GPUN - Dir. - Planning & Reg. Affairs
R.W. Keaten	GPUN - V.P. - Technical Functions
Fred P. Barbieri	GPUN - Mechanical Engineering
Steve Frantz	Morgan, Lewis and Backus
David Masiero	GPUN - Mechanical Engineering
Keith Brown	GPUN - Public Affairs
Ron Hernan	NRC/NRR - TMI Project Manager
Stephen M. Pindale	NRC - Resident Inspector (Oyster Creek)
Paul Gunter	NIRS
David Stellfox	McGraw-Hill
Biff Bradley	NEI
Gary Holahan	NRC/NRR/DSSA
Phil McKee	NRC/NRR/DRPE
Steve Varga	NRC/NRR/DRPE
Steven West	NRC/NRR/DSSA/SPLB
Edward Connell	NRC/NRR/DSSA/SPLB
Conrad McCracken	NRC/NRR/DSSA/SPLB
John Solakiewicz	GPUN/QV Manager/Oyster Creek
Douglas Pickett	NRC/NRR/DRPW
David Distel	GPUN Licensing

OYSTER CREEK NUCLEAR

GENERATING STATION

THERMOLAG FIRE BARRIER

PARAMETER VERIFICATION MEETING

AUGUST 30, 1995

AGENDA

- | | | |
|------|---|----------------|
| I. | INTRODUCTION | R. KEATEN |
| II. | OBJECTIVE | R. KEATEN |
| III. | THERMOLAG BARRIER PARAMETER
VERIFICATION | F. BARBIERI |
| IV. | OCNGS QA PROGRAM REQUIREMENTS | J. SOLAKIEWICZ |
| V. | SUMMARY | R. KEATEN |

OBJECTIVE

- PROVIDE ADDITIONAL INFORMATION TO ENHANCE UNDERSTANDING OF THE ISSUE
- DEMONSTRATE THAT PROCUREMENT, RECEIPT, AND INSTALLATION UNDER AN APPROVED 10CFR50 APPENDIX B QUALITY ASSURANCE PROGRAM AT OYSTER CREEK PROVIDES APPROPRIATE VALID AND VERIFIABLE INFORMATION TO JUSTIFY RELIANCE ON THERMOLAG TO MEET NRC FIRE PROTECTION REQUIREMENTS
- IMPROVE UNDERSTANDING BETWEEN THE STAFF AND GPUN ON THE ISSUES AND AGREE ON A COURSE OF ACTION TO ACHIEVE RESOLUTION

COMMUNICATION HISTORY

- DECEMBER 21, 1993 - NRC IDENTIFIED 24 IMPORTANT PARAMETERS. REQUESTED INFORMATION ON PARAMETERS VERIFIED.
- FEBRUARY 10, 1994 - GPUN PERFORMING WALKDOWNS TO IDENTIFY IMPORTANT PARAMETERS. OTHER PARAMETERS TO BE VERIFIED BY INSTALLATION DOCUMENTS.
- DECEMBER 27, 1994 - GPUN PROVIDED UPDATE ON WALKDOWN COMPLETION AND DATA COLLECTED TO SUPPORT VERIFICATION. STATED REVIEW OF INSTALLATION DOCUMENTATION WILL SUPPORT OTHER PARAMETERS.
- DECEMBER 29, 1994 - NRC REQUESTED INFORMATION ON NUMBER & TYPE OF REPRESENTATIVE BARRIER CONFIGURATIONS TO BE EXAMINED.
- MARCH 31, 1995 - GPUN STATED ORIGINAL QC ON INSTALLATION PERMITS VERIFICATION BY REVIEW OF INSTALLATION DOCUMENTS.
- MAY 24, 1995 - NRC STATED PARAMETERS CAN ONLY BE VERIFIED BY DETAILED EXAMINATIONS.
- JULY 6, 1995 - GPUN DESCRIBED QA PROGRAM ATTRIBUTES AND RESULTS OF DESTRUCTIVE EXAMINATION OF 3-HOUR BARRIER.
- JULY 17, 1995 - GPUN DOCUMENTS QA PROGRAM REQUIREMENTS/CRITERIA APPLIED TO INSTALLATION AND RESULTS OF EXAMINATION PERFORMED.
- AUGUST 22, 1995 - NRC STATED SOME PARAMETERS CAN ONLY BE VERIFIED BY DETAILED EXAMINATION. EXAMINATION PERFORMED NOT REPRESENTATIVE.

BASIS FOR NRC POSITION (REF. DEC. 29, 1994 LETTER)

- **SPECIFIC INDUSTRY EXPERIENCE AS DOCUMENTED IN INFO. NOTICE 91-79.**

GPU QUESTIONED PLANTS REFERENCED IN 91-79

RESULTS

- **TWO OF THREE PLANTS DO NOT HAVE QUALITY CONTROL RECORDS OF ORIGINAL INSTALLATION**
- **ONE OF THREE PLANTS INSTALLED TO 10CFR50 APPENDIX B; HOWEVER, QA RECORDS SHOW SIGNOFFS AT HOLD POINTS ONLY. NO SPECIFIC PARAMETERS DOCUMENTED.**

OBSERVATION

- **BASED ON THIS REVIEW, GPUN'S QA PROGRAM CONTROLS AND DOCUMENTATION FOR THERMOLAG INSTALLATION IS DIFFERENT THAN PLANTS IDENTIFIED IN INFO. NOTICE 91-79. GPUN BELIEVES ITS LEVEL OF DOCUMENTATION EXCEEDS THAT OF THESE PLANTS.**

OYSTER CREEK

EXTENT OF THERMOLAG INSTALLED

<u>TYPE</u>	<u>APPROXIMATE AMTS</u>
● CONDUIT (INCLUDES RADIAL BENDS, LBD's & JUNCTION BOXES)	1055 FT
● DUCT WRAP	600 FT ²
● PENETRATION BOXES (7)	315 FT ²
● STAIRWELL ENCLOSURE	NOT REQUIRED AS A RATED FIRE BARRIER - LETTER DATED SEPT. 16, 1994

24 IMPORTANT BARRIER PARAMETERS
FROM NRC LETTER DATED DEC. 21, 1993

<u>CATEGORIES OF PARAMETERS</u>	<u>NO. OF PARAMETERS</u>
● VISIBLE W/O DESTRUCTIVE EXAM	10
● ENDURANCE RATING CONSERVATIVELY ESTABLISHED	6
● NOT APPLICABLE TO OYSTER CREEK	4
● EXPECT TO UPGRADE	1
● STRESS SKIN ORIENTATION - MUST BE LOCATED ON AT LEAST ONE SIDE FOR FORMATION	1
● RELIANCE ON VERIFICATION RECORDS	2

KEY PARAMETERS REQUIRING VERIFICATION BY QA VERIFICATION RECORDS

- **MATERIAL THICKNESS**
- **PRE-BUTTERING OF JOINTS**

QUALITY CONTROL APPLIED TO THERMO-LAG

INSPECTIONS:
MANUFACTURING
RECEIPT
INSTALLATION

VERIFICATION:
NRC - 24 PARAMETERS

QUALITY CONTROL

MATERIAL INSPECTIONS

- **INSPECTORS CERTIFIED BASED ON EDUCATION AND EXPERIENCE**
- **INSPECTORS PROVIDED WITH INSPECTIONS CHECKLISTS FOR PANELS AND CONDUITS**
 - **SOURCE INSPECTION AT THE VENDOR**
 - **CHECKS OF MATERIAL FABRICATION**
 - **VERIFIED PROPER MANUFACTURE OF MATERIALS TO CHECKLIST CRITERIA**
 - **VERIFYING TEST SET-UPS**
 - **SITE SUPPLIED MATERIALS USED IN TEST SET-UPS**
 - **TEST CONFIGURATION CHECKS TO GPUN REQUIREMENTS**
 - **CALIBRATED TEST EQUIPMENTS/SENSOR LOCATION**
 - **MATERIAL CHECKS MADE ON ARRIVAL ON-SITE**
 - **CHECK PERFORMED ON THERMO-LAG MATERIALS**
 - **DAMAGE (GOUGES, CRUSHING, CHIPPING)**
 - **STRESS SKINS IN PLACE**
 - **NO CRACKS OR SEPARATION OF MATERIAL FROM STRESS SKINS**
 - **PROPER RATED THICKNESS**
 - **PARTS STRAIGHT, NO VOIDS, EDGES STRAIGHT AND FLAT FOR ALIGNMENT**
 - **CONDUIT DIAMETERS WITHIN TOLERANCE**
 - **TROWEL GRADE MATERIAL SHELF LIFE ALLOWS TIME FOR INSTALLATION**
 - **ACCEPTABLE MATERIALS TAGGED/ISSUED FOR USE**

QUALITY CONTROL

INSTALLATION INSPECTIONS

- INSPECTORS CERTIFIED BASED ON EDUCATION AND EXPERIENCE
- TEN INSPECTORS ALSO QUALIFIED AS A CERTIFIED THERMO-LAG INSTALLER
- TWO FULL TIME THERMO-LAG INSPECTORS FOR CONTINUITY OF INSTALLATION
- AT LEAST ONE CERTIFIED INSTALLER PRESENT FOR INSTALLATION WORK
- INSPECTED INSTALLATIONS TO A FULL 10CFR50 APPENDIX B PROGRAM
 - MATERIAL VERIFICATION CHECKS MADE PRIOR TO INSTALLATION
 - PROPER RATED THICKNESS CHECKS PERFORMED DURING FABRICATION
 - VOIDS, CRACK & GAPS REPAIRED OR REJECTED
 - CHECKS MADE FOR PRE-BUTTERING, ALIGNMENT, ARRANGEMENT
 - CHECKS MADE FOR UNDERFILL (OVERALL FINAL EVEN COATING)
 - CHECKS FOR BAND SPACING ≤ 12 INCHES
 - CHECKS FOR 18 INCH CRITERIA FOR PENETRATING ELEMENTS
 - CHECKS FOR BONDING AND SEALING TO CONCRETE STRUCTURES
 - FINAL WALKDOWN AFTER COMPLETIONS FOR OVERVIEW/REVIEW OF WORK

NRC APPROVED OPERATIONAL QA PLAN SINCE 1974

IMPORTANT BARRIER PARAMETERS

QUALITY CONTROL CHECKS

	PARAMETER	VERIFICATION PROCESS
1	RACEWAY ORIENTATION	NONE
2	CONDUIT	VERIFIED SIZE
3	JUNCTION BOXES & LATERAL BENDS	VERIFIED LOCATION AND SUPPORT MECHANISM
4	LADDERBACK CABLE TRAY	NA
5	CABLE TRAY WITH T SECTION	NA
6	RACEWAY MATERIAL	NONE
7	SUPPORT PROTECTION (PENETRATING ELEMENTS)	DETERMINED AND PROTECTED ALL ATTACHMENTS & SUPPORTS
8	AIR DROPS	VERIFIED
9	BASELINE FIRE BARRIER PANEL THICKNESS	PERFORMED AT SOURCE, RECEIPT & INSTALLATION INSPECTIONS (3X)
10	PREFORMED CONDUIT PANELS	PERFORMED AT SOURCE, RECEIPT & INSTALLATION INSPECTIONS
11	PANEL RIB ORIENTATION	NONE

	PARAMETER	VERIFICATION PROCESS
12	UNSUPPORTED SPANS	NONE
13	STRESS SKIN ORIENTATION	ALREADY PREFORMED IN FABRICATION PROCESS
14	STRESS SKIN OVER JOINTS	NONE - NO STRESS SKIN APPLIED
15	STRESS SKIN TIES/NO STRESS SKIN TIES	NONE - NO STRESS SKIN TIES
16	DRY FIT, POST BUTTERED OR PRE-BUTTERED	BOTH PRE BUTTERED AND POST JOINTS (SMOOTH AND EVEN WITH ASSEMBLY)
17	JOINT GAP WIDTH	NA (PRE-BUTTERED & POST BUTTERED)
18	BUTT JOINTS OR GROOVED & SCORED JOINTS	VERIFIED WITHIN INSTALLATION INSTRUCTIONS
19	STEEL BANDS OR TIE WIRES	VERIFIED
20	BAND/WIRE SPACING	VERIFIED
21	BAND WIRE DISTANCE TO JOINTS	NONE
22	NO INTERNAL BANDS IN TRAY	NA
23	NO ADDITIONAL TROWEL MATERIAL OVER SECTIONS & JOINTS OR ADDITIONAL TROWEL MATERIAL APPLIED	VERIFIED FINAL FILL (SMOOTH AND EVEN ASSEMBLY)
24	NO EDGE GUARDS OR EDGE GUARDS	NONE

FROM ESTABLISHED INSPECTION CHECKLISTS AND REPORTS

DESTRUCTIVE EXAM
PERFORMED

- ABANDONED THERMOLAG 3 HOUR CONDUIT (1 1/2") FIRE BARRIER ENVELOPE - APPROXIMATELY 2 FT SECTION DISMANTLED CONSISTING OF PREFORMED CONDUIT SECTIONS & PREFORMED PANEL SECTIONS WHICH FORM BOX AROUND SUPPORT

-
APPROXIMATELY 5 BUTT JOINTS EXAMINED

- BARRIER INSTALLED IN 1984 PRIOR TO DEVELOPMENT OF DETAILED QUALITY VERIFICATION CHECKLIST USED IN LATER THERMOLAG CONSTRUCTION EFFORTS
- EXAM PERFORMED UNDER QUALITY VERIFICATION GROUP SUPERVISION
- VERIFIED
 - THICKNESS
 - STRESS SKIN ORIENTATION
 - VOID STATUS
 - PRE-BUTTERING AND POST BUTTERING OF JOINTS
 - BAND SPACING

CONCLUSION

ALL ABOVE INSTALLED PARAMETERS WERE ACCEPTABLE

SUMMARY

- LIMITED SCOPE OF THERMOLAG CONFIGURATIONS AT OCNGS
- 10CFR50 APPENDIX B PROGRAM ADEQUATE TO VERIFY IMPORTANT PARAMETERS
- DISASSEMBLY OF ONE 3-HOUR CONDUIT BARRIER CONFIRMED ACCEPTABLE PARAMETERS
- RESPONSE TO AUGUST 22, 1995 RAI WILL REITERATE THESE DISCUSSIONS