

Duquesne Light Company

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GEORGE S. THOMAS
Division Vice President
Nuclear Services
Nuclear Power Division

April 16, 1993

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

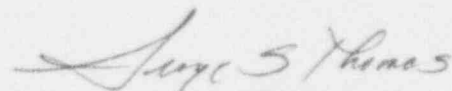
Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
NRC Generic Letter 92-08, Thermo-Lag 330-1 Fire Barriers

Provided in Enclosure 1 is a response to NRC Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers" for the Beaver Valley Power Station Unit 1 and Unit 2.

Generic Letter 92-08 provides an overview of developments of the Thermo-Lag fire barrier issue, and requests information pursuant to 10 CFR 50.54(f) relative to installed Thermo-Lag barriers.

Should you have any questions regarding this information or require additional information, please contact John Maracek at (412) 393-5232.

Sincerely,


G. S. Thomas

Attachment

cc: Mr. L. W. Rossbach, Sr. Resident Inspector
Mr. T. T. Martin, NRC Region I Administrator
Mr. G. E. Edison, Project Manager
Mr. W. P. Dornsife, Director BRP/DER
Mr. R. J. Barkanic, BRP/DER
Mr. M. L. Bowling (VEPCO)

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COMMONWEALTH OF PENNSYLVANIA)) SS:
COUNTY OF BEAVER)

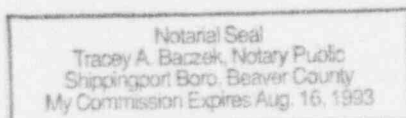
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Thermo-Lag 330-1 Fire Barriers

Before me, the undersigned notary public, in and for the County and Commonwealth aforesaid, this day personally appeared George S. Thomas, to me known, who being duly sworn according to law, deposes and says that he is Division Vice President, Nuclear Services of the Nuclear Power Division, Duquesne Light Company, he is duly authorized to execute and file the foregoing submittal on behalf of said Company, and the statements set forth in the submittal are true and correct to the best of his knowledge, information and belief.

George S. Thomas

Subscribed and sworn to before me
on this 16th day of April, 1993

Tracy A. Baczek
Notary Public



Member, Pennsylvania Association of Notaries

Response To NRC Generic Letter 92-08 For
Beaver Valley Power Station Unit 1 and Unit 2

ENCLOSURE 1

Generic Letter 92-08 requested that licensees address various items relative to Thermo-Lag 330-1 Fire Barriers. This enclosure provides specific responses to each of the items requested.

1. State whether Thermo-Lag 330-1 barriers are relied upon (a) to meet 10 CFR 50.48, to achieve physical independence of electrical systems, (b) to meet a condition of a plant's operating license, or (c) to satisfy a licensing commitment. If applicable, state that Thermo-Lag 330-1 is not used at the facility. This generic letter applies to all 1-hour and all 3-hour Thermo-Lag 330-1 materials and barrier systems assembled by any assembly method such as by assembling preformed panels and conduit shapes, as well as spray, trowel and brush-on applications.

Response

As previously identified in our response to NRC Bulletin 92-01 and Supplement No. 1, Thermo-Lag 330-1 barriers are relied upon at BVPS Unit 1 and BVPS Unit 2 to comply with the fire protection requirements of 10 CFR 50.48 for protection of safe shutdown components and electrical systems to satisfy NRC requirements.

Thermo-Lag was not utilized at our BVPS Unit 1 and BVPS Unit 2 facilities for Regulatory Guide 1.75 applications. Neither Unit utilizes Thermo-Lag as a radiant energy shield inside containment areas.

2. (a) State whether or not the licensee has qualified the Thermo-Lag 330-1 fire barriers by conducting fire endurance tests in accordance with the NRC's requirements and guidance or licensing commitments.

Response

Thermo-Lag 330-1 fire barrier systems installed at BVPS Unit 1 and BVPS Unit 2 were initially qualified to industry standards applicable at that time. Subsequently, NRC Bulletin 92-01 and Supplement No. 1 reported the existing Thermo-Lag barrier qualification testing invalid and the fire resistance rating of the Thermo-Lag material indeterminate.

2. (b) State (1) whether or not the fire barrier configurations installed in the plant represent the materials, workmanship, methods of assembly, dimensions, and configurations of the qualification test assembly configurations; and (2) whether or not the licensee has evaluated any deviations from the tested configurations.

Response

Our installed Thermo-Lag 330-1 fire barrier systems are based on manufacturer's design and installation instructions. The existing qualification tests were determined invalid per NRC Bulletin 92-01 and Supplement No. 1 to the Bulletin. Fire barriers in the affected areas were declared potentially inoperable and hourly fire watch patrols were instituted as an interim measure until permanent corrective actions can be implemented. Appropriate actions to restore fire barrier operability are being developed through an industry program being coordinated by NUMARC.

Engineering evaluations have been developed for existing fire rated assemblies located in the cable mezzanine area of BVPS Unit 1 which utilize Thermo-Lag 330-1. The configurations have been reviewed by a qualified fire protection engineer in accordance with NRC Generic Letter 86-10 and found to provide an equivalent level of protection to that of a tested configuration.

2. (c) State (1) whether or not the as-built Thermo-Lag 330-1 barrier configurations are consistent with the barrier configurations used during the ampacity derating tests relied upon by the licensee for the ampacity derating factors used for all raceways protected by Thermo-Lag 330-1 (for fire protection of safe shutdown capability or to achieve physical independence of electrical systems) and (2) whether or not the ampacity derating test results relied upon by the licensee are correct and applicable to the plant design.

Response

The original ampacity derating factors used for cable in conduit protected with Thermo-Lag 330-1 fire barrier systems were based on the manufacturer's recommendations of 3% for a one hour barrier (1/2" thickness) and 11% for a three hour barrier (1" thickness). These derating factors were supported by testing which appears in TSI Technical Note 111781 titled, "Engineering Report On Ampacity Test For 600 Volt Power Cables Installed In A Five Foot Length Of Two Inch Conduit Protected With Thermo-Lag 330-1 Subliming Envelope System," Revision 5, dated February, 1985, which is representative of the installation at our facility.

Based on the recent concerns identified in this generic letter, a review of the cabling system that employs the Thermo-Lag product was performed and the results are as follows:

The voltage level classifications at Beaver Valley are:
H - 4160 volt power
L - 480 volt power (intermittent & continuous loads)
K - 480 volt power (intermittent/lighter loads)
C - Control (intermittent 120 VAC & 125 VDC)
X - Instrumentation (signal)

The control and instrument level cables were not considered for derating due to the nature of their service and the resulting negligible heat release from these cables. An evaluation of the original derating calculation was performed to address the higher derating factors referenced in the generic letter (i.e., 37.4% for one hour and 38.9% for three hours) for potential impact on the installed 4160 and 480 volt power cables. Results revealed that all of the "K" level and most of the "L" & "H" level power cables had sufficient design margin to accommodate the higher derating factors. "L" & "H" level power cables that are intermittent loading were not considered. Three (3) cases required further evaluation and the Neher-McGrath method, utilizing the heat transfer characteristics of the materials in the cable-conduit assembly (rather than using derating multiplier factors), was used for the evaluation. All cables were determined to have adequate capacity after the derating assessment.

The cable derating issue will be re-evaluated after the results of the pending NUMARC derating testing. This proposed test will utilize the methodology of IEEE Standard P848, (Draft) "Procedure for the Determination of the Ampacity Derating of Fire Protected Cables."

3. With respect to any answer to items 2(a), 2(b), or 2(c) above in the negative, (a) describe all corrective actions needed and include a schedule by which such actions shall be completed and (b) describe all compensatory measures taken in accordance with the technical specifications or administrative controls.

Response

Appropriate measures to restore fire barrier operability are being developed through an industry program coordinated by NUMARC. Plant specific engineering evaluations are being developed to verify compliance with NRC regulatory requirements for Thermo-Lag 330-1 fire barrier systems. Interim compensatory measures previously identified in our response to Bulletin 92-01 and Supplement 1 will remain in place until permanent corrective actions can be implemented or an engineering evaluation has been developed to verify compliance with NRC regulatory requirements.

We will continue to work with NUMARC and the industry to develop a course of action to ensure the fire barriers are capable of performing their design function. NUMARC's generic test program should bound the configurations used at our facility; however, should corrective actions be required as a result of this testing program, the options available will be evaluated on a case by case basis. Generic ampacity derating factors are being developed under the NUMARC program.

Specific schedules relative to the NUMARC generic test program will be provided to NRC by NUMARC.

4. List all Thermo-Lag 330-1 barriers for which answers to item 2 cannot be provided in the response due within 120 days from the date of this generic letter, and include a schedule by which such answers shall be provided.

Response

The complete response to item 2 is provided herein.