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MIDDLE SOUTH UTILITIES SYSTEM

March 2, 1983

L.V. MAURIN
Vice President Nuclear Operations

W3P83-0678
L.09.02
Q-3-A20.16

Director of Nuclear Reactor Regulation
ATTENTION: Mr. G. W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
Non-Metallic Materials

Reference: NRC Letter, Thomas M. Novak to L. V. Maurin, dated January 3, 1983

Dear Mr. Knighton:

The purpose of this letter is to provide the Louisiana Power & Light response to the referenced letter which requested additional information on the effects of harsh environment on non-metallic materials of components in safety-related systems. Specifically, NRC requested that Louisiana Power & Light (1) Identify the non-metallic materials in safety systems, (2) Identify the environmental conditions to which these materials will be exposed, and (3) Evaluate the capability of the material to withstand the above determined conditions.

In response to this request, a comprehensive evaluation of all safety-related purchase orders has been conducted. The materials were identified by a review of parts lists and bills, the environment was determined from the NUREG-0558 evaluation, and the threshold values used for evaluation were derived from several sources including the vendor. A summary of the results of this evaluation is included herewith as attachment. This attachment contains the information requested above for all, save a few, materials. For these few, data has been requested from the manufacturer. This listing will be updated and resubmitted when the required information is available.

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If you have any questions or comments, please advise.

Yours very truly,

L. V. Maurin

LVM/SMJ/ssd

cc: Jim Wilson (NRC), Hukam Garg (NRC), R. LaGrange (NRC), M. W. Yost (EG&G), E. R. Holloway (EG&G), E. L. Blake, W. M. Stevenson

SUMMARY OF EQ EVALUATION OF NON-METALLIC PARTS

MATERIAL	TEMPERATURE °F Act. Norm.	Worst cond. DBA	Threshold	Reference	RADIATION RAD T.I.D. (Worst)	Threshold	Reference	Remarks
Asbestos	120	414 (Peak)	1200	1	5.2E7	Note (1)	1	Qualified
Braided Asbestos	120	414 (Peak)	1200	1	3.3E7	Note (1)	1	Qualified
Buna N	120	414	300	2	3.3E7	5.0E7	5	Qualified Note (2)
Epoxy	104	148	250	2	2.5E6	1.0E9	2	Qualified
EPDM	120	414	300	7	3.3E7	1.0E8	5	Qualified Note (2)
Ethylene-Propylene	120	414 (Peak)	300	7	3.3E7	5.0E7	6	Qualified Note (2)
Ethylene-Propylene terpolymer	120	414 (Peak)	300	7	3.3E7	1.0E8	5	Qualified Note (2)
Fiberglass-Epoxy	120	414 (Peak)	550	2	3.3E7	2.0E8	5	Qualified
Flexitallic	120	414	550	1	3.3E7	Note (1)	1	Qualified
Grafoil	120	414 (Peak)	1300	3	3.3E7	9.1E8	3	Qualified
Graphite	120	414 (Peak)	1300	3	3.3E7	9.1E8	3	Qualified
GTR	120	414 (Peak)			3.3E7			Note (3)
Neoprene	104	115	250	2	4.2E6	5.0E6	5	Qualified

MATERIAL	TEMPERATURE °F Act. Norm.	Worst Cond. DBA	Threshold	Reference	RADIATION RAD T.I.D. (Worst)	Threshold	Reference	Remarks
Nitrile	104	148	300	2	5.2E7	7.0E7	5	Qualified
Nitrile rubber	104	104	300	2	4.2E6	1.0E7	2	Qualified
Nomex	104	148	428	4	2.5E6	6.4E9	4	Qualified
Nylon	120	414 (Peak)	225	2	3.3E7	1.0E6	2	Note (4)
Polyarmide	120	414 (Peak)	500	2	3.3E7	1.0E9	2	Qualified
Polyurethane	120	414 (Peak)	300	2	3.3E7	8.0E7	2	Qualified
Silicone rubber	120	414 (Peak)	500	1	3.3E7	8.0E6	1	Note (4)
Synthetic rubber (Poyurethane)	120	414 (Peak)			3.3E7	4.3E7	5	Note (6)
Rubber (Natural)	120	414 (Peak)			5.2E7	1.0E8	5	Note (6)
Urethene	104	148	250	2	1.1E6	8.0E7	2	Qualified
Viton	104	140	250	1	5.2E4	1.0E7	1	Qualified
John Crane 187-I	120	414 (Peak)	1200	1	3.3E7	Note (1)	1	Qualified
John Crane 187-IX	120	414 (Peak)	1200	1	3.3E7	Note (1)	1	Qualified
(John) Crane #888	104	150	300	1	4.2E6	1.0E7	1	Qualified
Anchor Target	104	104			4.0E7			Note (3)

MATERIAL	TEMPERATURE °F Act. Norm.	Worst cond. DBA	Threshold	Reference	RADIATION RAD T.I.D. (Worst)	Threshold	Reference	Remarks
TRUARC	120	414 (Peak)			3.3E7			Note (3)
Butyl Sealant (3M "Weatherbank 404")	104	104	300	5	8.9E6	1E7	8	Qualified
Carbon Graphite Wicks	104	104	See remarks		2.5E6	See remarks		Acceptable (Note 5)
"Fabreeka Pads" fabric impregnated w/Bunan	120	414 (Peak)	350	5	3.3E7	1E7	9	Acceptable (Note 5)
Graphite Filament (J Crane 1625 GF)	104	104	> 104	Mild Temp. Environment	2E6	>2E6	1	Qualified
Grafoil #240	104	104	1300	3	2.5E6	9.1E8	3	Qualified
Neoprene Sponge	120	414 (Peak)	250	12	3.3E7	8.7E7	5	Qualified (Note 2)
Silicone Sealer (GE RTV-106 or DOW 781)	120	414 (Peak)	500	7	3.3E7	8E6	1	Acceptable (Note 4)
Silicone Rubber	120	414 (Peak)	500	7	3.3E7	8E6	1	Acceptable (Note 4)
Sealing Compound	104	104	150	11	2.5E6	> 1E7	11	Qualified (Similar to Portland Cement)
Nordel (EPDM) HVAC Check Valves	120	414 (Peak)	300	1	3.3E7	5E7	6,5	Qalified (Static Seal) (Note 2)
V-Belts Assorted (Rubber & Fabric)	NOT APPLICABLE							Acceptable (Note 5)
PVC Gaskets (AHV Doors)	104	104	>104	Mild Temp. Environment	8.9E6	1E8	5	Qualified
Red Lead & Asbestos Paste	104	104	Not Applicable See Remark		1E4	Not Applicable See Remark		Qualified (mild envir.)

References:

1. "BWR Operators Manual for Materials and Processes", GE document NEDE 20583, dated October, 1974.

2. "The Use of Plastics and Elastomers in Nuclear Radiation", W W Parkinson and O Sisman, Nuclear Engineering and Design, 17 (1971) 247-280.

3. Grafoil Product data sheet, Union Carbide Corp.

4. Properties and Performance of NOMEX, DuPont Technical Information, Bulletin NX-7, November, 1977.

5. EPRI NP-2129 Project 1707-3, "Radiation Effects on Organic Materials in Nuclear Plants", Final Report November, 1981.

6. EPRI NP-1558 Project 890-1, "A Review of Equipment Aging Theory and Technology," Final Report September, 1980.

7. 1973 Rubber Technology, Maurin Morton, Editor, sponsored by the Rubber Division of the Americal Chemical Society.

8. "The Use of Plastics and Elastomers in Nuclear Radiation", Oak Ridge Labs October, 1970.

9. Record Telecon with Fabreeka Products Inc., February 14, 1983.

10. "Effects of Nuclear Radiation on Materials and Components" by Kircher and R E Bowmen-Reinhold Publishing.

11. General Electric RTV Silicone Rubber Product Data Sheet Rev 4, 1982.

12. Machine Design - "Materials Reference Issue," March 16, 1978.

NOTES:

1. Considered suitable for any nulcear application except reactor core area per Reference 1.

2. Based on thermal lag analysis in NUREG-0588 evaluation, the material will not be exposed to a temperature more than the threshold value.

3. The material breakdown from the brand name has not yet been ascertained. Evaluation on-going.

4. Material acceptable since its failure will not adversly affect system performance.

5. Material acceptable since non-metallic part is normally replaced before radiation or temperature degradation.

6. Temperature threshold values not available. Values are being sought in consulation with the suppliers.