



LOUISIANA
POWER & LIGHT

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May 7, 1984

W3P84-1281
3-A1.01.04
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
Environmental Qualification

REFERENCE: LP&L Letter W3P84-0881

Dear Sir:

At the request of our NRC Equipment Qualification Branch reviewer, Mr. H. Garg, the referenced letter provided detailed qualification information packages on the non-metallic materials in three pieces of mechanical equipment. Subsequently, Mr. Garg requested additional information on our selection of radiation threshold values. In response to that request, please find attached revised cover sheets for the three information packages previously provided by the referenced letter.

Furthermore, prior to achieving initial commercial operation, LP&L will identify preestablished replacement intervals for the non-metallic materials whose failure could impact the overall safety function of mechanical equipment located in a harsh environment. These replacement intervals will be based on published test data and industry accepted analytical methods such as radiation reduction and thermal lag.

We understand that this information is adequate to close out all remaining Environmental Qualification concerns.

Yours very truly,

K.W. Cook
Nuclear Support & Licensing Manager

KWC/RMF/pco

cc: E.L. Blake, W.M. Stevenson, J.T. Collins, D.M. Crutchfield,
J. Wilson, G.L. Constable, H. Garg

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EBASCO SERVICES INCORPORATED
LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES UNIT NO. 3

> n. 10 of 2

EQ OF SAFETY RELATED MECHANICAL EQUIPMENT

Equipment: 2 BM - F108 A/B **P.O. No.:** NY-403522 **Spec. No/Item No** 400-1564 103A/46
Function: RDT Stop & Containment Isolation Valve
Location - Bldg: Cont. Elevation: -10' **Coordinates:** X=98, Y=34 **Room:** 5W
 (See Note ++)

Environmental Conditions:

Temperature, °F	Radiation, Rad	Pressure, Psig	Rel. Humidity, %	Chem. Spray (++)
Normal 120	40 yrs. 3.1E5	Atm	20-100	-
DBA 414 (Peak)	T.I.D 3.3E7	40 (Peak)	100	1750-2150 ppm Boron pH 5.0-9.0

Non-metallic Parts:

Item	Material	Temp., °F	Threshold Rad., Rad	Part ID Reference	Material Reference
1. Valve					
Diaphragm Gr. M	EPT (EPDM Ref 9, P. 186)	300(+)	1.0EB	(1)	(5) P. 26-1/(6), P. 3-24 R.1
O-Rings	EPT	300(+)	1.0EB (*)	(1)	↓
Gasket	EPT	300(+)	1.0EB (*)	(1)	↓
2. Actuator Diaphragm	Buna-N	300(+)	4.0EB	(1),(2)	(9) P. 186/(6) P. 3-29 ↓
3. Fisher 67 Airset:					
Diaphragm	Nitrile (Rubber)	300(+)	7.0EB	(3),(4)	(9) P. 186/(10) P. 272 R.1
Valve Plug	Rubber	300(+)	1.0EB	(3)	(7) P. 7-18/(6) P. 3-27
Gaskets	Acheson	500	(*)	(3)	(8) P. 2/(5) P. 2.6-1
	Neoprene	300(+)	8.7E7	(3)	(6) P. 328/(6) P. 3-28
Filter	Cellulose	185(**)	1.0EB(**)	(3)	(6) P. 3-4/(6) P. 3-8

References :

1. ITT Grinnell dwg. SD-C-103736, EMDRAC 1564-4667 Rev. 2
2. ITT Grinnell telex dated. 2-14-84
3. Fisher 67F & 67FR Series Regulators Instruction Manual
4. Fisher Controls Telex on 4-26-83
5. "BWR Operators Manual for Materials and Processes", GE document NEDE-20583A, dated November 1978
6. EPRI NP-2129 Project 1707-3, "Radiation Effects on Organic Materials in Nuclear Plants", Final Report November 1981
7. EPRI NP-1558 Project 890-1, "A Review of Equipment Aging Theory and Technology", Final Report September 1980.
8. John Crane Mechanical Packings
9. Machine Design - "Materials Reference Issue" March 16, 1978
10. "The Use of Plastics and Elastomers in Nuclear Radiation", W.W. Parkinson R.1 and O. Sisman, Nuclear Engineering and Design, 17 (1971) 247-280. ↓

Notes :

- * Considered suitable for any nuclear application except reactor core area per Reference 5.
- ** Filter material must be periodically inspected and replaced in accordance with the maintenance instructions in Reference 3. Its failure will not adversely affect system performance.
- + Based on thermal leg analysis in NUREG-0588 evaluation, the material will not be exposed to a temperature more than the threshold value.
- ++ The valve has already completed its safety function when being flooded.
- +++ Organic parts are enclosed and not exposed to chemical spray

(†) Although these values would normally be based on compression set, because the primary nonmetallic-material-based failure mode of the valve would be via the valve diaphragm, the acceptable radiation threshold of the diaphragm was used.

R.1
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EBASCO SERVICES INCORPORATED
LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES UNIT NO. 3
EQ OF SAFETY RELATED MECHANICAL EQUIPMENT

Equipment: SG-MSNB-734-1A P.O. No.: CE-112 Spec. No/Item No. _____
Function: Steam Generator Supports Hydraulic Snubber
Location: Bldg. Cont. Elevation: 49' Coordinates: W Room: SG #1

Environmental Conditions:

	<u>Temperature, °F</u>	<u>Radiation, Rad</u>	<u>Pressure, Psig</u>	<u>Rel. Humidity, %</u>	<u>Chem. Spray (*)</u>
Normal	120	40yrs 1.4E7	Atm.	20-100	—
DBA	414 (Peak)	T.I.D 2.8E7	40 (Peak)	100	1750-2150 ppm Boron pH 5.0-9.0

Non-metallic Parts:

<u>Item</u>	<u>Material</u>	<u>Threshold</u>		<u>Part ID Reference</u>	<u>Material Reference</u>	
		<u>Temp., °F</u>	<u>Rad., Rad</u>			
Head and Piston Seal	Tefzel (280)	300(**)	1.0E8	(1) Dwg PD18113 ↓	(4) Table 1 / (1) P. A1 ↓	
Rod Seal	Tefzel (280)	300(**)	1.0E8			
R.1 Chevron Pack	EPR(*)	250(**)	5.0E7			
↓ Rod Wiper	EPR(*)	250(**)	5.0E7			(2) P. 2.6-1 / (3) P. C-2, Fig. C-1 ↓
Fluid	GE's SF-1154	500	3.0E7			(5) P. 1 / (1) P. A3 ↓

References :

1. Paul Monroe Hydraulic Inc.
Instruction Manual for Hydraulic Snubbers for Steam Generator
Supports and Reactor Coolant System Component Supports
Ebasco EMDRAC #5817-3281 R0
2. 'BWR Operators Manual for Materials and Processes', GE
document NEDE-20583A, dated November
3. EPRI NP-1558 Project 890-1, "A Review of Equipment Aging
Theory and Technology" Final Report September 1980
4. DuPont Tefzel Design Handbook
5. GE Silicones Technical Information : CDS-4176

Notes :

- * Organic materials are enclosed and not exposed to
chemical spray
- ** Based on thermal leg analysis, the materials will not be
exposed to a temperature more than the threshold value.
- † EPR is the popular name of ethylene-propylene (rubber). R.1

EBASCO SERVICES INCORPORATED
LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES UNIT NO. 3
EQ OF SAFETY RELATED MECHANICAL EQUIPMENT

Sh. 1 of 2

Equipment: Waste Gas Compressor A, B P.O. No.: CE-600 Spec. No./Item No. 9270-PE-450 (Project)
00000-PE-450 (General)
 Function: Processes gas from the Gas Surge Tank and compresses it for storage in the gas decay tanks.
 Location - Bldg: AUX Elevation: -35' Coordinates: K-2A, K-3A Room: Waste Gas Compr. A, B

Environmental Conditions:

	<u>Temperature, °F</u>	<u>Radiation, Rad</u>	<u>Pressure, Psig</u>	<u>Rel. Humidity, %</u>	<u>Chem. Spray</u>
Normal	6-102	40y1s 4E7	Atm	20-90	—
DBA	120	T.I.D. 4E7	Atm	20-90	NA

Non-metallic Parts:

<u>Item (**)</u>	<u>Material</u>	<u>Threshold Temp., °F</u>	<u>Rad., Rad</u>	<u>Part ID Reference</u>	<u>Material Reference</u>
1. Compressor O-Ring	Buna-N	300	(†) 5.0E7	(1) A-11, Dwg's ^{ML58-73015} ML54-73015	(1) P.186 / (4) P.3-29
Gasket	Buna-N	300	(†) 5.0E7	(1) A-11, Dwg ML119306	
2. Filter O-Ring	Buna-N	300	(†) 5.0E7	(1) A-4, P.3	
Seal	Buna-N	300	(†) 5.0E7	(1) A-4, P.3	
3. Liquid Trap O-Ring	Buna-N	300	(†) 5.0E7	(1) A-4, P.5	
4. Cooler Gaskets	Flexitallic	550	(*)	(1) A-4, P.5	(2) P.26-1 / (2) P.26-1
5. Valves					
Packing	Asbestos	500	(*)	(1) A-10, Dwg. N9301P12Y5	(6) P.1 / (2) P.2.6-1
	Graphite	1300	1.5E9	(1) A-10 ^{N9301P8Y6} ^{N9301P3Y7 Sh.2}	(3) P.1 / (3) P.1 (5)

References :

1. Aminco/Corblin Compressor AICV150 Instruction Manual C2-2763 dated December, 1978
2. "BWR Operators Manual for Materials and Processes", GE document NEDE-20583A, dated November 1978
3. Union Carbide Corp. Technical Bulletin No. 524-205
4. EPRI NP-2129 Project 1707-3, "Radiation Effects on Organic Materials in Nuclear Plants", Final Report November 1981
5. Letter from Oak Ridge National Laboratory to Union Carbide Corp.
6. John Crane Mechanical Packings
7. Machine Design - "Materials Reference Issue" March 16, 1978

Notes :

* Considered suitable for any nuclear application except reactor core area per Reference 2

** Since the compressor does not have AM or PAM function, only the pressure retaining parts are considered as safety related.

† Minimum radiation threshold value for tensile strength given in Ref. 4. The maximum threshold value is 4.0EB rads. R.1