



# MISSISSIPPI POWER & LIGHT COMPANY

Helping Build Mississippi

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NUCLEAR LICENSING & SAFETY DEPARTMENT

November 8, 1985

U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta St., N. W., Suite 2900  
Atlanta, Georgia 30323

Attention: Dr. J. Nelson Grace, Regional Administrator

Dear Dr. Grace:

SUBJECT: Grand Gulf Nuclear Station  
Unit 1  
Docket No. 50-416  
License No. NPF-29  
File: 0260/L-835.0  
Special Report 85-014/0,  
Excessive Steam Tunnel  
Temperature  
AECM-85/0357

From October 12, 1985 at 1300 to October 13, 1985 at 0030 hours, temperatures in the Auxiliary Building Steam Tunnel exceeded the 125°F limit of Technical Specification 3.7.8. The maximum temperature reached in this 11.5 hour period was 128°F. The temperature limit was exceeded due to valve packing gland leaks. The plant began a scheduled maintenance outage at 0001 on October 13, 1985. The leaks will be repaired prior to plant restart which is currently scheduled for November 19, 1985.

An engineering analysis was performed to demonstrate the continued operability of the affected equipment. Much of the equipment is qualified to a 40 year life at 140°F. The qualified life of other equipment was slightly reduced. The new calculated qualified lives are shown in the attached summary. The qualified lives of the affected equipment, which is tracked by the computerized Maintenance Planning and Scheduling System (MPSS), will be revised accordingly.

This Special Report is submitted in accordance with the requirements of the action statement of Technical Specification 3.7.8 and pursuant to Technical Specification 6.9.2.

Yours truly,

L. F. Dale  
Director

EBS/SHH:bms  
Attachments

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PDR ADCC 05000416  
S PDR

cc: (See Next Page)  
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Member Middle South Utilities System

IE22  
1/1  
IE17

cc: Mr. T. H. Cloninger (w/a)  
Mr. O. D. Kingsley, Jr. (w/a)  
Mr. R. B. McGehee (w/a)  
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SUMMARY OF TEMPERATURE ANALYSIS  
AUXILIARY BUILDING STEAM TUNNEL

PURPOSE:

The analysis provides new qualified lives for class 1E electrical equipment located in the Auxiliary Building Main Steam Line Tunnel which are required to be qualified in accordance with 10 CFR 50.49. The following is a summary of NPE Electrical Calculation EC-Q1111-84004, Rev. 2.

REFERENCES:

1. PMI-84/6981 dated 06/14/84, "Main Steam Line Tunnel Excessive Temperatures"
2. PMI-85/5709 dated 05/31/85, "Auxiliary Steam Tunnel Excessive Temperatures"
3. PMI-85/5780 dated 06/11/85, "Auxiliary Steam Tunnel Excessive Temperatures"
4. PMI-85/9450 dated 10/23/85, "Auxiliary Building Steam Tunnel Excessive Temperatures"
5. EQCF Book# NO1, "MSIV NAMCO Limit Switches"
6. EQCF Book# NO2, "PYCO Temperature Elements"
7. EQCF Book# MO2, "MSIV ASCO Solenoids"
8. EQCF Book# BOO, "Terminal Blocks"
9. EQCF Book# B21, "Bechtel Spec.# 9645-M-242.0, M.O.V.'s & A.O.V.'s Outside Containment"
10. EQCF Book# B22, "Bechtel Spec.# 9645-M-251.0, Limitorque M.O.V. Actuators Outside Containment"
11. MP&L-ES-19, "Environmental Equipment Qualification Maintenance"
12. EPRI NP-1558, dated September 1980, "A Review of Equipment Aging Theory and Technology"
13. NPE Electrical Calculation EC-Q1111-84004, Revision 2.

DESIGN CRITERIA:

1. NUREG 0588
2. 10 CFR 50.49
3. GGNS FSAR Chapter 3.11
4. IEEE-323-1974
5. IEEE-323-1971
6. GGNS Technical Specification 3.7.8

METHODOLOGY:

The Arrhenius method is used to calculate the qualified life. Reference (12) contains a detailed description of the Arrhenius Theory.

SERVICE CONDITIONS:

1. Per design criteria (6), the design operating (normal) temperature of the Auxiliary Building Steam Tunnel is 125°F.
2. Per reference (1) thru (4), this temperature has been exceeded for the following durations and temperatures:

<u>DURATION (HOURS)</u>	<u>TEMPERATURE (°F)</u>
97.0	130
258.75	137
131.5	129
16.5	139
14.0	126
24.0	127
24.0	129
24.0	132
24.0	134
24.0	135
12.0	139
11.5	128
Total Duration: 661.25 Hours	Temperature Did Not Exceed 140°F

ASSUMPTIONS:

1. Some of the items are used throughout the plant and their qualified life was based on temperatures of 140°F or higher. For these items, the qualification is unaffected at the temperatures seen in the Steam Tunnel.
2. The service temperature is assumed to be 140°F for the durations (total) that service condition (1) was exceeded. This is chosen as a conservative value since the temperature never exceeded 139°F.
3. The failure parameter is due to thermal exposure of the weak link non-metallic material.
4. The total duration is 662 hours for conservatism.

QUALIFIED LIFE CALCULATIONS:

The qualified life calculations were accomplished by:

1. Determining the number of hours of aging necessary to show qualification to the excessive temperatures.
2. Utilizing the remaining aging data to calculate the additional life at 125°F (normal temperature).
3. Or by demonstrating that the equipment is qualified at 140°F normal temperature.

Attachment 2 contains the tabulated data and results.

TABULATION OF AGING CALCULATIONS

<u>Equipment</u>	<u>Aging Temp.</u>	<u>Aging Duration</u>	<u>Act. Ener.</u>	<u>Excessive Temp. Required Aging</u>	(Minus 10% Margin) <u>Add. Life At 125°F</u>	<u>Qualified Life</u>
MSIV NAMCO Limit Switches	150°C	860 hours	.95			40 years @ 140°F
MSIV ASCO Solenoid Valves	250°F	438 hours	.94	4.12 hours	16.75 years	16.82 years total
PYCO Temperature Elements	120°C	2,390 hours	.96			40 years @ 140°F
Limitorque M.O.V.'s						
1. Insulation	Log Life = $\frac{4675.475}{T_a} - 7.045$ (Limitorque Supplied Equation)					40 years @ 140°F
2. Limit & Torque Switch	150°C	60,000 hours	.96			40 years @ 140°F
3. Hook Up Wire	(Previously Qualified at 90°C for 40 Years)					40 years @ 140°F
4. Terminal Blocks	150°C	100 hours	1.02	0.344	49.545 years	40 years
NAMCO Limit Switches on Other A.O.V.'s	248°F	402.5 hours	0.8	9.38	5.88 years	5.95 years total
ASCO Solenoid Valves on Other A.O.V.'s	(Previously Qualified at 140°F)					4.0 years @ 140°F total