MISSISSIPPI POWER & LIGHT COMPANY
Helping Build Mississippi
P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

July 20, 1981

NUCLEAR PRODUCTION DEPARTMENT

RECEIVED
JUL 27 1981
U.S. NUCLEAR REGULATORY COMMISSION

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417
File 0260/0862
Transmittal of Proposed FSAR Changes and Responses to NRC Questions
AECM-81/235

References:
1) Procedure Test Review Branch Question 423.42
2) Power Systems Branch Question 40.106
3) Chemical Engineering Branch Questions 013.47, 281.2, and 281.7
4) Effluent Treatment Systems Branch Question 320.24
5) Containment Systems Branch Question 021.54

In response to your request for additional information, Mississippi Power & Light Company is submitting the enclosed materials updating information pertaining to the above referenced items.

This information represents changes to the Grand Gulf Nuclear Station Final Safety Analysis Report (FSAR).

These proposed FSAR changes will be incorporated into a forthcoming amendment to the FSAR (Amendment No. 50). If you have any questions or require further information, please contact this office.

Yours truly,

John J. Richardson for

L. F. Dale
Manager of Nuclear Services

RFP/JGC/JDR:lm

Attachments: (See Next Page)

B001
S/1

8107280189 810720
PDR ADOCK 05000416
A PDR

Attachments:

1. Question & Response 423.42
2. Question & Response 40.106
3. Question & Response 13.47
4. Question & Response 281.2
5. Question & Response 281.7
6. Question & Response 021.54
7. Question & Response 320.24

cc: Mr. N. L. Stampley
Mr. G. B. Taylor
Mr. R. B. McGehee
Mr. T. B. Conner

Mr. Victor Stello, Jr., Director
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

GG
FSAR

423.42 The response to Item 423.30 is not totally acceptable. Modify the response to 1.i (21) to provide a startup test abstract that will evaluate the adequacy of cooling for those selected penetrations where fins were analytically determined to be necessary. For all other high-temperature penetration lines where analysis indicated no cooling was required, either include those penetrations in the aforementioned startup test abstract or provide:

- Evaluation methodology.
- Maximum concrete temperature criteria.
- Assumed heat transfer coefficients.
- Description of similar applications where, for comparable temperatures and materials, no cooling was used successfully.

RESPONSE

The response to 1.i(21) of Question 423.30 has been revised to provide a test abstract that will evaluate the adequacy of cooling for those selected penetrations where fins were analytically determined to be necessary.

For all other penetrations the following is provided:

- Evaluation Methodology

  The penetrations have been evaluated using a computer program to predict the temperature in the concrete containment wall. The analysis was a two dimensional analysis that modeled the piping, the concrete liner plate, and surrounding ambient temperature. The program has the capability to have as many as 1,750 lattice points, 100 regions, 30 materials and 50 boundary conditions. The analysis assumed steady-state, maximum operating conditions. The "Extrapolated Liebmann Method" and a modification of the "Aitken δ^2 Extrapolation Process" was used to solve the finite difference equations which approximate the partial differential equations for this steady-state analysis.

- Maximum Concrete Temperature Criteria

  A temperature of less than 200°F anywhere in the concrete adjacent to the penetration was used as acceptance criteria.

- Assumed Heat Transfer Coefficients

  See attached Table 423.42-1.

- Description.....of similar applications

  The Joseph M. Farley Unit, which also uses natural convective cooling on certain penetrations, successfully conducted testing which verified the analytical model used.

TABLE 423.42-1

ASSUMED THERMAL PROPERTIES FOR
PENETRATION ANALYSIS

Material	Temp. °F	Conductivity $\frac{Btu}{hr - ft^2 - {}^\circ F}$	Surface Emissivity
Reinforced Concrete	-	1.0	.75
Reflective Insulation	-	.056 - .118*	.15
Calcium-Silicate Insulation	300	.42	.15
	700	.60	.15
Air	100	.0157	-
	300	.0203	
	500	.0246	
	700	.0284	
Carbon Steel	212	30.	.15
	392	28.	.15
	572	26.	.15

*Calculated from overall conductance (depends on geometry and thickness).

GG
FSAR

Q4 3.30
1.1(21)
Revised

An evaluation of the temperature of the concrete that surrounds high-temperature lines such as main steam, feedwater, etc., was performed during the design of the plant. The results of the evaluation demonstrated that some cooling would be required for selected penetrations. For these penetrations, cooling fins were added to increase the heat transfer surface area for the following:

Penetration Number	System
9, 10	Nuclear boiler, main feedwater
14	Residual heat removal
17	RCIC
83, 87, 88	Reactor water cleanup

The ambient air provides the cooling medium. For the main steam line, the guard pipe and flued head provided enough heat transfer surface area so that cooling fins are not required.

The concrete around selected piping penetrations shall be instrumented with a series of temperature sensors in order to estimate the concrete temperature radial profile. Temperature measurements will be compared to the temperatures of the analytical model used in the aforementioned evaluation to confirm the adequacy of the analytical model.

The model predicts that the most limiting concrete temperatures will be in the vicinity of the RCIC steam supply line, containment/auxiliary building penetration No. 17, a finned penetration. However, since the RCIC system is not operational during normal steady-state conditions, the time required to heat up the concrete from ambient to equilibrium hot temperature would require extensive RCIC operation. An alternate and more efficient approach is to monitor a typical set of penetrations, finned and non-finned.

The Reactor Water Cleanup (RWCU) finned penetration No. 83 between the containment and auxiliary buildings will be monitored for comparison to the analytical model. This piping is expected to be at or near its equilibrium temperature during normal operation.

The main steam line penetrations between the containment and auxiliary buildings were determined to be the most limiting non-finned penetrations, therefore, temperature of the concrete surrounding a single main steam line penetration will also be monitored for comparison to the analytical model.

Q423.30
1.i(21)
Revised
(Cont'd)

A comparison between the RCIC steam line and the RWCU and main steam line penetrations is listed below:

Penetration Number	System	Process Temperature Assumed	Analytical Concrete Temperature	Limiting Acceptance Temperature
17	RCIC	550°F	193.5°F	200°F
83	RWCU	437°F	177.3°F	200°F
5,6,7, or 8	MS	550°F	191.8°F	200°F

A test abstract (14.2.12.3.40) has been provided in Chapter 14 to evaluate the adequacy of penetration cooling.

14.2.12.3.40 Test Number 79 - Penetration Cooling

a. Test Objective

The purpose of this test is to demonstrate the ability of natural convection to cool the concrete surrounding selected high temperature finned and non-finned pipe penetrations in the containment wall, and to verify the analytical model used to evaluate the adequacy of the convective cooling approach.

b. Prerequisites

The preoperational tests are complete; the PSRC has reviewed and approved the test procedures and initiation of testing. Instrumentation has been installed and calibrated.

c. Test Procedure

The penetration cooling tests consist of measuring concrete temperatures surrounding selected Main Steam and RWCU discharge piping penetrations in the containment and auxiliary buildings. Measurements from a series of temperature sensors, located on the concrete, will be taken at various steady-state operating power levels. The measurements will be compared to the analytically predicted temperatures and will be shown to be acceptable in relation to the results of the analysis and the design criteria. 423.30

Readings will be taken during the initial reactor heatup and at each major power level during the power ascension test phase.

d. Acceptance Criteria

Level 1

The temperature of the concrete adjacent to the selected containment penetrations shall not exceed 200°F.

Level 2

The temperature of the concrete surrounding the selected containment penetrations shall not exceed the values predicted by analysis.

040.106 (8.3) Provide a detail discussion (or plan) of the level of training proposed for your operators, maintenance crew, quality assurance, and supervisory personnel responsible for the operation and maintenance of the emergency diesel generators. Identify the number and type of personnel that will be dedicated to the operations and maintenance of the emergency diesel generators and the number and type that will be assigned from your general plant operations and maintenance groups to assist when needed. In your discussion identify the amount and kind of training that will be received by each of the above categories and the type of ongoing training program planned to assure optimum availability of the emergency generators.

Also discuss the level of education and minimum experience requirements for the various categories of operations and maintenance personnel associated with the emergency diesel generators.

RESPONSE

At Grand Gulf, dedicated personnel are not assigned to the operation or maintenance of specific components such as the emergency diesel generators.

Operation and minor maintenance of the emergency diesel generators is performed by or under the cognizance of a Nuclear Operator "A" (licensed operator). Maintenance of the emergency diesel generators is performed under the supervision of a Maintenance Supervisor (supervisor not requiring a license). These personnel are trained in accordance with requirements in Regulatory Guide 1.8; 9/75 as described in Appendix 3A.

The Grand Gulf Training program is described in Section 13.2. The emergency diesel generators are classified as a "Q" system and as such are monitored by the MP&L Quality Assurance Program as described in NRC Topical Report MPL-TOP-1. The training of quality assurance personnel is addressed therein.

GG
FSAR

DESCRIPTION OF DIESEL ENGINE TRAINING
ADDITIONS TO CHAPTER 13

13.2.1.1.16 Diesel Engine Training for Licensed and Non-Licensed Operators

All licensed and non-licensed operator personnel responsible for the safe operation of the emergency diesel generators shall have successfully completed the manufacturer's school or the equivalent for that component. Operator personnel will be instructed, as a minimum, in at least the following areas listed below:

a. Engine construction and materials
b. Auxiliary systems associated with the engine
c. Normal and abnormal operating characteristics
d. Diesel engine startup and loading procedure
e. Diesel engine protective features, overload conditions
f. Control systems
g. Importance of diesel engine pre-lube system
h. Basic troubleshooting
i. Importance of trends in the operating logs
j. Hazards of no load or low load conditions

40.106

13.2.1.2.13 Diesel Engine Training for Maintenance Personnel

All maintenance personnel responsible for the maintenance of the emergency diesel generators shall have successfully completed the manufacturer's school or equivalent on that component. These personnel will be instructed, as a minimum, in at least the following areas listed below:

a. Engine construction and materials
b. Auxiliary systems associated with the engine
c. Diesel engine protective features, overload conditions
d. Control systems
e. Importance of diesel engine pre-lube system
f. Basic troubleshooting

GG
FSAR

013.47 In Table 9A-1 of your FSAR, you indicate that the formal plant ventilation systems would be used to ventilate smoke and other products of combustion. Since the ventilation equipment may not handle the smoke because of clogged filters, it is our position that portable smoke exhaust fans and ducts be provided. The portable units provided should be designed for such use, should be capable of being used without offsite power, and should be sufficient in number and capacity to provide ventilation for any area of the plant where normal ventilation systems cannot be relied upon.

RESPONSE

Portable smoke ejection fans dedicated for use in removal of smoke, hot air and dangerous gases, and providing proper ventilation have been provided for use by the plant fire brigade. The portable smoke ejectors are rated at 5200 C.F.M. and are powered by a 115 VAC, 60 cy, Explosion Proof motor. Portable emergency generators have been provided to enable the usage of the portable smoke ejectors when offsite power is not available. These units are stragically located along with similar fire fighting equipment throughout the plant to facilitate quick and easy access by members of the fire brigade. Portable ducting, compatible for use with the emergency smoke ejectors is also provided to enable removal of smoke and products of combustion through a desired channel to the outside atmosphere.

GG
FSAR

281.2 (10.4.6) Establish and state the sequential regeneration frequency in order to maintain adequate capacity margin in the condensate treatment system (Regulatory Position C.2 of Regulatory Guide 1.56, revision 1). Include the basis for the resin regeneration frequency.

RESPONSE

The sequential regeneration frequency for each condensate demineralizer has been established as being less than or equal to 60 days per demineralizer.

This frequency is based on the recommendations given in the General Electric Report NEDO-10899 73 NED59, Class 1, June 1973 entitled "Chloride Control in BWR Coolants." This provides a sequential regeneration frequency commensurate to the guidance given by Regulatory Position C.2 in Regulatory Guide 1.56, Revision 1, July 1978.

GG
FSAR

Q281.7 (10.4.6) Describe the water chemistry control program to assure maintenance of condensate demineralizer influent and effluent conductivity within the limits of Table 2 of Regulatory Guide 1.56, revision 1. Include conductivity meter alarm set points and the corrective action to be taken if the limits of Table 2 are exceeded.

RESPONSE

The water chemistry control program to assure maintenance of condensate demineralizer influent and effluent conductivity within the limits of Table 2 of Regulatory Guide 1.56, Revision 1, is as follows:

a. Establishment of limits in accordance with Regulatory Guide 1.56, Revision 1, July 1978, as indicated in the response to Question 281.1.

b. Establishment of alarm set points as indicated in the response to Question 281.5.

c. Conductivity monitors are checked for accuracy on a monthly basis.

Corrective actions to be taken if limits in Table 2 of Regulatory Guide 1.56, Revision 1, July 1978, are exceeded are presented in approved station off-normal event procedures. These procedures describe the actions to be carried out by plant operators in the event of a high conductivity level in the condensate system. The procedural steps as summarized from plant procedures include the following:

Immediate Operator Actions

- Notify the Shift Supervisor of the condition.
- Carry out actions as listed by procedure as required by the level of conductivity in a given section of the condensate system.
- If the reactor has scramed, refer to other off-normal event procedures referenced.

Subsequent Operator Actions

(Reactor in Operation)
- Locate and correct the cause of the high conductivity.
- Take grab samples of feedwater and reactor water for chloride analysis.
- Reduce reactor power level.
- Operate the RWCU system at Maximum capacity.
- Increase deep bed demineralizer regeneration frequency.

Q281.7
(10.4.6)

RESPONSE (Cont'd)

(Reactor Shutdown)

- Initiate orderly cooldown.
- Monitor reactor water chemistry.
- Locate and correct the cause of the high conductivity; isolate cause.

GG
FSAR

Q21.54 The response to Item 021.20 only discussed the initial test program that will be carried out to verify the depressurization of the secondary containment to a negative pressure of 1/4 inch. Provide the acceptance criteria for the draw down time. It is our position that a periodic test program also be established to determine the operability of the system.

Also, provide a description of the preoperational and periodic test program that will determine the secondary containment infiltration rate, including the acceptance criteria.

RESPONSE

As described by the safety design basis referenced in subsections 6.2.3.1.1 and 6.5.3.2 revised in Amendment 49 (July 15, 1981), the Standby Gas Treatment System is designed to achieve negative 0.25 in. w.g. pressure throughout the volume of the SGTS boundary region within 120 seconds after actuation. The acceptance criteria for each SGTS filter train required to drawdown and maintain negative 0.25 in. w.g. pressure within 120 seconds after actuation is presented in the preoperational test program discussed in subsection 14.2.12.1.34 revised in Amendment 49 and is referenced in subsections 6.2.3.4 and 6.5.1.4.1. Regularly scheduled testing and post-operational surveillance requirements established by Technical Specification sections 3/4 6.6.1 and 3/4 6.6.3.1, verify system operability.

During preoperational and periodic testing, flow and differential pressure indications are available in the control room to enable monitoring actual performance of the SGTS. As described in subsections 6.5.3.2 and 6.5.3.3, revised in Amendment 49, the SGTS has a capacity (assuming single train operation) significantly greater than that required to drawdown the secondary containment to negative 0.25 in. w.g. within the 120 seconds analyzed in Chapter 15 and greater than that required to maintain negative pressure during post drawdown for infiltration rates greater than the value generated in the infiltration analysis; i.e., 2300 cfm. The drawdown time required for the SGTS to achieve a negative 0.25 in. w.g. pressure in the boundary region has been conservatively calculated using a 2300 cfm infiltration rate to be 101 seconds; therefore, a 19 second margin is available to adequately drawdown the secondary containment with infiltration greater than design. During long term operation for infiltration rates greater than design, the SGTS has the capacity to establish a maximum system flow rate up to 4000 cfm, as required to maintain the design negative pressure. The actual secondary containment infiltration rate is within design limits provided the above stated acceptance criteria for preoperational and periodic testing of the SGTS is met. Each SGTS train must meet this criteria with the other train secured.

GG
FSAR

320.24 You have indicated in Table 11.5-3 that your monitoring and sampling in the standby service water system is performed inprocess rather than in the effluent as specified in SRP 11.5. This is acceptable if Table 11.5-3 indicates that the grab samples are analyzed for "gross radioactivity," "tritium radioactivity," and "principal identification of and concentration of radionuclides and alpha emitters," and you make a commitment to use the results of these analyses to calculate radioactive releases via this pathway. Your FSAR should be revised, accordingly, to indicate your compliance in this area.

RESPONSE

Table 11.5-3 has been revised to indicate that the grab samples are analyzed for "gross radioactivity," "tritium radioactivity," and "principal identification and concentration of radionuclides and alpha emitters."

Grand Gulf will use the results of the analyses referenced above to calculate radioactive releases via this pathway.