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

NORRIS L. STAMPLEY
VICE PRESIDENT

March 19, 1980

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20556

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 0272/0270/L-860.0/16684/0755
Ref.: AECM-80/24
Follow-up Action Regarding the Three Mile Island Unit 2 Accident
AECM-80/26

The purpose of this letter is to transmit the Mississippi Power & Light Company responses to IE Bulletin 79-08 (Attachment 1) as well as plant unique data requested by the Bulletins and Orders Task Force (Attachment 2). Also included are our responses to Bulletins and Orders Task Force requests for additional information concerning NEDO-24708 (Attachments 3 and 4).

Sincerely,

Norris L Stampley

MRK/JDR/LFD:pa
Attachments

cc: Mr. R. B. McGehee
Mr. T. B. Conner

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

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(ATTACHMENT I)
MISSISSIPPI POWER & LIGHT COMPANY
GRAND GULF NUCLEAR STATION - UNITS 1 & 2

ITEMIZED RESPONSE TO IE BULLETIN 79-08

QUESTION 1

Review the description of circumstances described in Enclosure 1 of IE Bulletin 79-05 and the preliminary chronology of the TMI-2 3/28/79 accident included in Enclosure 1 to IE Bulletin 79-05A.

a. This review should be directed toward understanding: (1) the extreme seriousness and consequences of the simultaneous blocking of both trains of a safety system at the Three Mile Island Unit 2 plant and other actions taken during the early phases of the accident; (2) the apparent operational errors which led to the eventual core damage; and (3) the necessity to systematically analyze plant conditions and parameters and take appropriate corrective action.

b. Operational personnel should be instructed to (1) not override automatic action of engineered safety features unless continued operation of engineered safety features will result in unsafe plant conditions (see Section 5a of this bulletin); and (2) not make operational decisions based solely on a single plant parameter indication when one or more confirmatory indications are available.

c. All licensed operators and plant management and supervisors with operational responsibilities shall participate in this review and such participation shall be documented in plant records.

RESPONSE

A review of the information contained in Enclosure 1 to IE Bulletin 79-05 and 79-05A was completed. A training session was conducted covering the points specified in items 1.a and 1.b for all operators, licensed and non-licensed, as well as plant management and supervisors with operation's responsibilities. Documentation of this review and training session is available at the site.

Training personnel have been instructed to stress the importance of the points made in Item 1 of this bulletin in the operator training program.

QUESTION 2

Review the containment isolation initiation design and procedures, and prepare and implement all changes necessary to initiate containment isolation, whether manual or automatic, of all lines whose isolation does not degrade needed safety features or cooling capability, upon automatic initiation of safety injection.

RESPONSE

A review of Grand Gulf's containment isolation initiation design was performed to ensure that systems not needed for an ECCS injection would isolate if an injection signal were present. During this review (which excluded emergency core cooling and make-up systems because of their needed safety features), it was determined that Grand Gulf's design provides the necessary containment and reactor coolant pressure boundary isolation prior to or simultaneous with initiation of emergency core cooling and safety injection systems in all areas except, plant service water and component cooling water. Presently, these two closed systems contain check valves and remote-manually operated valves for containment isolation. The adequacy of the design for these two systems is currently under evaluation. Upon completion of these evaluations, appropriate modifications will be made if determined necessary. Each of these systems forms a closed loop in the containment and do not have an open path to the containment atmosphere. This does not preclude the possibility of line failure in the containment but in light of the incident being reviewed, the present configuration appears to be adequate. The remainder of containment penetrations which did not involve lines needed to perform a safety function were determined to have the necessary isolation via an automatic isolation or due to the fact that valves on these lines are normally closed during operation.

Grand Gulf will have specific Operating Instructions for Containment Isolation which will include isolation criteria, step by step directions for completing all manual actions, and for verifying completion of all automatic actions required for containment isolation.

Isolation valves will remain shut even if the initiating signal clears until reset by the operator. Procedures will also include stepwise directions and precautions for resetting containment isolation signals and reopening lines penetrating the containment following an isolation event.

QUESTION 3

Describe the action, both automatic and manual, necessary for proper functioning of the auxiliary heat removal systems (e.g., RCIC) that are used when the main feedwater system is not operable. For any manual action necessary, describe in summary form the procedure, by which this action is taken in a timely sense.

RESPONSE

This response describes both automatic and manual actions necessary for proper functioning of the auxiliary heat removal systems. These systems are used when the main feedwater system is not operable. The procedures are described in summary form assuming the reactor is scrammed and isolated from the main condenser.

Automatic action provides abundant make-up water to the core for initial cooling. Long term core and containment cooling can be provided with few manual actions. Information is available to the operator in the control room to assist him in taking the required manual actions. Information in the control room permits the operator to verify that the objective of these actions is being achieved.

The auxiliary heat removal systems provided to remove decay heat from the reactor core and containment following loss of the feedwater systems are:

High Pressure Core Spray (HPCS) System
Reactor Core Isolation Cooling (RCIC) System
Low Pressure Core Spray (LPCS) System
Residual Heat Removal (RHR) System
Automatic Depressurization System

The description that follows details the operation of the systems needed to achieve initial core cooling followed by containment cooling and then followed by extended core cooling for long term plant shut down.

Initial Core Cooling

Following a loss of feedwater and reactor scram, a low reactor water level signal (level 2) will automatically initiate the HPCS and RCIC Systems into the reactor coolant make-up injection mode. The HPCS and RCIC systems will continue to inject water into the vessel until a high water level signal (Level 8) automatically trips the RCIC system and closes the HPCS injection valve.

Following a high reactor water level 8 trip, the HPCS injection valve will automatically re-open when reactor water level decreases to the low water level signal (level 2). The RCIC system must be manually reset by the operator in the control room before it will automatically re-initiate after a high water level trip.

The HPCS and RCIC Systems have redundant supplies of water. Normally they take suction from the condensate storage tank (CST), which maintains 170,000 gallons of condensate in reserve for use by HPCS and RCIC. The RCIC and HPCS Systems suction will automatically transfer from the CST to the suppression pool if the CST water level is low or the suppression pool water level increases to a high level.

The operator can manually initiate the HPCS and RCIC Systems from the control room before the level 2 automatic initiation level is reached. The operator has the option of manual control after automatic initiation and can maintain reactor water level by throttling system flow rates. The Operator can verify that these systems are delivering water to the reactor vessel by:

a) Verifying reactor water level increases when systems initiate (see water level discussion in response to Question 4).
b) Verifying system flow using flow indicators in the control room.
c) Verifying system flow to the reactor by checking control room position indication of motor-operated valves. This assures no diversion of system flow from the reactor.

Therefore, the HPCS and RCIC systems can maintain reactor water level at full reactor pressure or until pressure decreases to where low pressure systems such as the Low Pressure Core Spray (LPCS) or Low Pressure Coolant Injection (LPCI) can maintain water level. If necessary, the operator can use one or more safety relief valves to depressurize the reactor.

Containment Cooling

After reactor scram and isolation and establishment of satisfactory core cooling, the operator would start containment cooling. This mode of operation removes heat resulting from safety relief valve discharge or RCIC turbine exhaust to the suppression pool. This would be accomplished by placing the Residual Heat Removal (RHR) System in the containment (suppression pool) cooling mode, i.e., RHR suction from and discharge to the supression pool.

The operator could verify proper operation of the RHR system containment cooling function from the control room by:

a) Verifying RHR and Standby Service Water (SSW) System flow using system control room flow indicators.
b) Verifying correct RHR and SSW system flow paths using control room position indication of motor-operated valves.
c) On branch lines that could divert flow from the required flow paths, closing the motor-operated valves and noting the effect on RHR and SSW flow rate.

Even though the RHR is in the containment cooling mode, core cooling is its primary function. Thus, if a low low reactor water level (Level 1) or a high drywell pressure signal is received at any time during the period when the RHR is in the containment cooling mode, the RHR system will automatically revert to the LPCI injection mode. The Low Pressure Core Spray (LPCS) system would automatically initiate and both the LPCI and LPCS systems would inject water into the reactor vessel if reactor pressure is below system discharge pressure.

Extended Core Cooling

When the reactor has been depressurized, the RHR system can be placed in the long term shutdown cooling mode. The operator manually terminates the containment cooling mode of one of the RHR containment cooling loops.

In this operating mode, the RHR system can cool the reactor to cold shutdown. Proper operation and flow paths in this mode can be verified by methods similar to those described for the containment cooling mode.

QUESTION 4

Describe all uses and types of vessel level indication for both automatic and manual initiation of safety systems. Describe other redundant instrumentation which the operator might have to give the same information regarding plant status. Instruct operators to utilize other available information to initiate safety systems.

RESPONSE

Reactor vessel water level is continuously monitored by 7 indicators or recorders for normal, transient and accident conditions. Those monitors used to provide automatic safety equipment initiation are arranged in a redundant array with two instruments in each of two or more independent electronic divisions. Thus, adequate information is provided to automatically initiate safety actions and provide the operator with assurance of the vessel water level at all times.

These water level measurement devices have operated in BWR Plants for 20 years. Tests of BWR water level instrumentation under simulated steam and water line breaks have been conducted showing satisfactory performance.

The range of reactor vessel water level from below the top of the active fuel area up to to the top of the vessel is covered by a combination of narrow and wide-range instruments. Level is indicated and/or recorded in the control room.

A separate set of narrow-range level instrumentation on separate condensing chambers provides reactor level control via the reactor feedwater system. This set also indicates or records in the control room (three level indicators and one level recorder).

The safety-related systems or functions served by safety-related reactor water level instrumentation are:

Reactor Core Isolation Cooling System (RCIC)
High Pressure Core Spray System (HPCS)
Low Pressure Core Spray System (LPCS)
Residual Heat Removal/Low Pressure Injection (RHR/LPCI)
Automatic Depressurization System (ADS)
Nuclear Steam Supply Shutoff System (NS^4)
Standby Service Water System (SSW)

All systems automatically initate on low reactor water level. In addition, the RCIC and HPCS systems shutdown on high reactor water level. The HPCS system automatically restarts if low reactor level is reached again. (See response to Question #3 for further discussion on this). In the case of RCIC, manual resetting is required if the high reactor vessel water level trip is reached.

Additional instrumentation which the operator can use to determine changes in reactor coolant inventory or other abnormal conditions are:

Drywell High Pressure
Containment High Radioactivity Levels
Supression Pool High Temperature
Safety Relief Valve (SRV) Discharge High Temperature
High/Low Feedwater Flow Rates
High/Low Main Steam Flow
High Containment, Steam Tunnel, and Equipment Area Differential Temperatures
High Differential Flow-Reactor Water Cleanup System
Abnormal Reactor Pressure
High Suppression Pool Water Level
High Drywell and Containment Sump Fill and Pumpout Rate
Valve Stem Leakoff High Temperatures

Low RCIC Steam Supply Pressure
High RCIC Steam Supply Flow
Low Main Steam Line Pressure

An example of the use of this additional information by the operator is as follows: Drywell high pressure is an indirect indication of coolant loss. Coincident high suppression pool temperature further verifies a loss of reactor coolant. High SRV discharge temperature would pinpoint loss of coolant via an open valve.

Other instrumentation that can signal abnormal plant status but not necessarily indicative of loss of coolant are:

High Neutron Flux
High Process Monitor Radiation Levels
Main Turbine Status Instrumentation
Abnormal Reactor Recirculation Flow
High Electrical Current (Amperes) to Recirc Pump Motors

Operators will be instructed in use of other available information to initiate safety systems as a continuing part of training.

Question 5

Review the action directed by the operating procedures and training instructions to ensure that:

a. Operators do not override automatic actions of engineered safety features, unless continued operation of engineered safety features will result in unsafe plant conditions (e.g. vessel integrity).

b. Operators are provided additional information and instructions to not rely upon vessel level indication alone for manual actions, but to also examine other plant parameter indications in evaluating plant conditions.

RESPONSE

All of this information will be specifically addressed in an Operations Section administrative procedure, which provides operators with guidelines for response to abnormal conditions. All Control Room Operators will be required to demonstrate specific knowledge of this procedure. (Additional information provided in response to Question 4 regarding additional information provided to the operator.)

Additionally, all Operations Instructions will be written keeping the Three Mile Island events in mind. Personnel who are preparing operation and administrative procedures for the control of maintenance activities will be briefed on the TMI incident and methods to procedurally avoid similar circumstances at Grand Gulf.

QUESTION 6

Review all safety-related valve positions, positioning requirements and positive controls to assure that valves remain positioned (open or closed) in a manner to ensure the proper operation of engineered safety features.

Also, review related procedures, such as those for maintenance, testing, plant and system startup, and supervisory periodic (e.g., daily/shift checks,) surveillance to ensure that such valves are returned to their correct positions following necessary manipulations and are maintained in their proper positions during all operational modes.

RESPONSE

A review of the emergency core cooling systems (ECCS) indicated that the system valves' positions are suitably controlled by the following means:

1. Automatic actuation of power operated valves within the system is provided to isolate the boundary/bypass paths and to align the system for proper operation. Main control room valve position indication is provided for these valves. The handswitches in the control room for these valves are spring return to the auto position to allow the valve to operate automatically if required.

2. Manual valves within the main flow path are provided with locking provisions to ensure correct valve positions. Manual valves which are not accessible during power operation (i.e., located in drywell) are also provided with main control room position indicating lights.

3. Manual valves on branch piping to the main flow path piping are provided with locking provisions if incorrect valve position could affect system safety function. Exceptions are the piping high point vents, low point drains, and test connection valves which are verified procedurally to be aligned properly for operation.

   For the condensate storage tank piping to the suction of the HPCS and RCIC pumps, the manual isolation valve adjacent to the storage tank will be verified procedurally that it has been aligned properly.

For all other safety-related systems other than ECCS, the power operated valves have been equipped with handswitches having the spring return feature and have been equipped with position indication in the control room. The manual valves in these systems will be verified procedurally that they have been aligned properly. These manual valves are not equipped with position indication in the control room.

All system P&IDs have been reviewed to verify that the valves are positioned correctly for proper operation of the safety-related system.

A revision to the Protective Tagging Procedure is being prepared to use miniature tags on control panels to avoid obscuring any active indicators on control panels.

The position of each manually operated valve will be identified in a valve line-up sheet. Valve line-up checks will be conducted as required by technical specifications to verify system flow paths. In addition, valve line-up checks will be conducted after each refueling outage and following any major work on a system. For safety related systems/components, this valve line-up will have independent verifications. Where appropriate, valves will be locked in the designated position to prevent inadvertent repositioning.

If valve positions are to be changed for surveillance purposes, the surveillance procedure will have steps requiring return to normal valve line-up prior to completion. Start and completion of surveillance procedures will be logged in the control room logbook.

When maintenance is performed on a safety related system which requires valves to be repositioned, administrative procedures governing conduct of maintenance will require:

1. The approval of the Shift Supervisor prior to performing maintenance to allow the Shift Supervisor to verify redundant flow paths, etc. prior to authorizing maintenance.

2. The maintenance work documents to specify post-maintenance functional checks or operability tests to verify system return to normal following maintenance activities.

When possible, Operations will perform a functional test or Surveillance Operability Test following maintenance on any safety related system. When such tests are not possible, a complete valve and electrical lineup will be performed within the tagged boundary and a partial functional test will be performed where possible to provide assurance that systems are in fact functional after maintenance.

System line-up changes, other than those covered by step-by-step procedures will be logged and abnormal line-ups will be covered during shift turnover.

During periodic tours, Operators and Supervisory personnel will conduct spot checks of fluid system and electrical line-ups.

QUESTION 7

Review your operating modes and procedures for all systems designed to transfer potentially radioactive gases and liquids out of the primary containment to assure that undesired pumping, venting or other release of radioactive liquids and gases will not occur inadvertently.

In particular, ensure that such an occurrence would not be caused by the resetting of engineered safety features instrumentation. List all such systems and indicate:

a. Whether interlocks exist to prevent transfer when high radiation indication exists, and
b. Whether such systems are isolated by the containment isolation signal.
c. The basis on which continued operability of the above features is assured.

RESPONSE

The following systems are capable of pumping or venting potentially radioactive fluids and gases from the containment:

1. Clean-up systems
2. Floor and equipment drains
3. Fuel transfer tube
4. Condensate and refueling water storage and transfer system
5. Containment cooling system
6. Combustible gas control system (containment purge mode)
7. Reactor sample lines

a. Of the systems listed above, only the combustible gas control system, and the containment cooling system isolate on a high radiation signal. There are no direct high radiation interlocks on liquid transfer lines.

b. All of the systems above are isolated by the Containment Isolation Control System except the fuel transfer tube, which is only used during refueling operations.

c. Continued operability of the Containment Isolation Control is assured during all modes of plant operation. Power to the isolation and control logic is provided by emergency power supplies. All isolation logic is de-energized to actuate, assuring isolation in the unlikely event of loss of power. In addition, each of these protective features is routinely calibrated and/or tested.

In addition, the Operations Instructions for Containment Isolation will describe how to reset isolation signals and establish specific flow paths during isolation to prevent inadvertent releases.

QUESTION 8

Review and modify as necessary your maintenance and test procedures to ensure that they require:

a. Verification, by test or inspection, of the operability of redundant safety-related systems prior to the removal of any safety-related system from service.

b. Verification of the operability of all safety-related systems when they are returned to service following maintenance or testing.

c. Explicit notification of involved reactor operational personnel whenever a safety-related system is removed from and returned to service.

Operating instructions will be written to adequately address all of the above modes of operation.

QUESTION 11

Propose changes, as required, to those technical specifications which must be modified as a result of your implementing the items above.

RESPONSE

Grand Gulf has not yet submitted technical specifications, however a draft is being prepared for submittal in 1980 keeping in mind the lessons learned from the Three Mile Island accident. Modifications to the draft will be made as necessary to implement the recommendations presented as a result of TMI.

(ATTACHMENT 2)

Mississippi Power & Light Company
Grand Gulf Nuclear Station
Units 1 and 2
(Docket Nos. 50-416 and 50-417)

Response to Bulletins and Orders Task Force Requests
UNIQUE PLANT DATA

I. BYPASS CAPACITY

Plant Steam Bypass Capacity is 35% of rated steam flow.

II. SYSTEMS AND COMPONENTS SHARED BETWEEN UNITS

System or Components	Shared Between Units Number
SSW Basin A	1 and 2
SSW Basin B	1 and 2
* SSW "A" recirculation line	1 and 2
* SSW "B" recirculation line	1 and 2
* SSW "A" transfer line to Basin B	1 and 2
* SSW "B" transfer line to Basin A	1 and 2
**SSW Basin A and B blowdown line	1 and 2
**SSW Basin A and B chlorination line	1 and 2
**SSW Basin A and B chemical treatment line	1 and 2

* Each line interconnecting the two SSW pump discharge lines has redundant automatic isolation valves.

**Failure of the nonessential chlorination, chemical treatment, or blowdown subsystems will not prevent the SSW System from performing its safety function.

III. PLANT-SPECIFIC SYSTEM INFORMATION

SYSTEM	GENERAL		WATER SOURCES		INSTRUMENTATION AND CONTROL		
	Safety Class.	Seismic Category	Safety Class.	Seismic Category	Safety Class.	Seismic Category	Frequency of System and Component Tests
1. RCIC	2	I	Note 2 2	I	2	I	Note 1
2. Isolation Condenser	Note 3						
3. HPCS	2	I	Note 2 2	I	2	I	
4. HPCI	Note 3						
5. LPCS	2	I	2	I	2	I	
6. RHR-LPCI	2	I	2	I	2	I	
7. ADS	1	I	Note 4	Note 4	2	I	
8. SRV	1	I	Note 4	Note 4	2	I	
9a. RHR Steam Condensing	2	I	2	I	Note 6 Other	Note 5	
9b. RHR S D Cooling, Supp. Pool Cooling, and CtMT Spray Modes)	2	I	2	I	2	I	
10. SSW	3	I	Note 10 3	I	3	I	
11. CCW	Note 6 Other	Note 5	Note 6 Other	Note 5	Note 6 Other	Note 5	
12. CRDS	Note 8 2	I	Note 9 2	I	2	I	
13. CST	Note 6 Other	Note 5	Note 6 Other	Note 5	Note 6 Other	Note 5	
14. Feedwater	Note 7	I	Note 6 Other	Note 5	Note 6 Other	Note 5	
15. Recirculation Pump/MTR Cooling	Note 3						

III. PLANT-SPECIFIC SYSTEM INFORMATION

1. Grand Gulf Technical Specifications have not yet been approved.

2. Alternate supply of water is from the suppression pool. The preferred source is from the non-seismic, non-safety class CST. RCIC and HPCS suction piping from CST is Safety Class 2 and Seismic Category I.

3. Not applicable to Grand Gulf.

4. Not applicable to this system.

5. The seismic requirements for the safe shutdown earthquake are not applicable to the equipment.

6. Safety Classification "other" designates structures, systems, and components in the power conversion or other portions of the facility which have no direct safety function but which may be connected to or influenced by the equipment within safety classes 1, 2, or 3.

7. The classification of the feedwater lines from the reactor vessel to and including the third isolation valve is Safety Class 1, beyond the third valve, the lines are safety class other (See Note 6).

8. HCU's, insert/withdraw piping, scram discharge volume. Remainder of CRDH system is other (Note 6) and seismic category NA (Note 5)

9. Scram accumulators and associated piping.

10. SSW Cooling Towers and Storage basins.

IV. CONTAINMENT ISOLATION VALVE INFORMATION

All of the requested information is found in the Grand Gulf FSAR (See GG-FSAR Table 6.2-44 and Figures 6.2-76 through 79) with the exception of the following:

A. All of the valves listed in Table 6.2-44 are Seismic Class I.

B. All valves listed in Table 6.2-44 have control room indication except for the following:

1. F11E015 is N/A (Transfer Tube)
2. B21F010A
3. B21F010B
4. E51F065
5. E12F019
6. E12F046A
7. E12F046C
8. E51F040
9. C11F122
10. P44F043
11. P71F151
12. P52F122
13. P53F002
14. P42F035
15. E51F021
16. E12F055B
17. E12F103B
18. E12F104B
19. G41F053
20. G41F201
21. P11F004
22. G41F040
23. E12F046B
24. P11F041
25. P53F006
26. E12F025C
27. E12F018
28. E12F036
29. E12F005
30. E12F055A
31. E12F104A
32. E12F103A
33. P41F169A
34. P41F169B

C. All valves listed in Table 6.2-44 are Quality Group B except for the following which are Quality Group A:

1. B21F028A
2. B21F022A
3. B21F067A
4. B21F028B
5. B21F022B
6. B21F067B
7. B21F028C
8. B21F022C
9. B21F067C
10. B21F028D
11. B21F022D
12. B21F067D
13. B21F032A
14. B21F010A
15. B21F032B
16. B21F010B
17. E12F008-A
18. E12F009-B
19. E51F063-B
20. E51F064-A
21. E51F076-B
22. E51F066
23. E51F065
24. E51F013-A
25. E12F023-A
26. E12F019
27. B21F019-A
28. B21F016-B
29. E12F042A-A
30. E12F041A
31. E12F042B-B
32. E12F041B
33. E12F042C-B
34. E12F041C-B
35. E22F004-C
36. E22F005
37. E21F005-A
38. E21F006
39. G33F001-B
40. G33F004-A

V. DESIGN REQUIREMENTS FOR CONTAINMENT ISOLATION BARRIERS

QUESTION

Discuss the extent to which the quality standards and seismic design classification of the containment isolation provisions follow the recommendations of Regulatory Guides 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Water-Containing Components of Nuclear Power Plants", and 1.29, "Seismic Design Classification".

RESPONSE

The design of the Containment Isolation system follows the recommendations of Regulatory Guide 1.26 and 1.29 as addressed in the Grand Gulf FSAR Appendix 3A.

VI. PROVISIONS FOR TESTING

QUESTION

Discuss the design provisions for testing the operability of the isolation valves.

RESPONSE

Every automatic containment isolation valve is provided with a handswitch in the control room for remote manual operation. Every automatic containment isolation valve is provided with position indication in the control room. The majority of the containment penetration isolation valves can be operability tested from the control room during normal plant operation. Certain systems or valves cannot be (or should not be) tested during normal plant operation. Examples of such valves are: 1) low pressure coolant injection valves cannot be opened when the reactor is at high pressure because a pressure permissive must be satisfied before the valve can be opened, 2) the outboard feedwater check valve cannot be closed during power operation because the exercising cylinder does not provide enough force to close the valve when feedwater is in operation.

VII. CODES, STANDARDS, AND GUIDES

QUESTION

Identify the codes, standards, and guides applied in the design of the containment isolation system and system components.

RESPONSE

A. The Containment Isolation system is designed in accordance with Seismic Category I requirements.

B. Containment isolation valves and associated piping and penetrations meet the requirements of ASME Code, Section III, Classes 1 or 2, as applicable.

C. Containment isolation for system lines which can provide an open path from the containment to the environs during normal operation is in accordance with NRC Branch Technical Position CSB 6-4 "Containment Purging During Normal Plant Operations".

D. Application of Regulatory Guides are described in the Grand Gulf FSAR in Appendix 3A, and more specific applications of selected guides to the Containment Isolation System are discussed in FSAR Section 7.3.2.2.2.1.1.

E. Containment Isolation Control System conformance to 10CFR50 Appendix A is discussed in FSAR Section 7.3.2.2.2.2.

F. Containment Isolation Control System conformance to industry codes and standards is discussed in Section 7.3.2.2.2.3.

VIII. NORMAL OPERATING MODES AND ISOLATION MODES

QUESTION

Discuss the normal operating modes and containment isolation provision and procedures for lines that transfer potentially radioactive fluids out of the containment.

RESPONSE

The response to the question is formated such that the following data is provided for each system line designation.

a. Fluid being transferred
b. Normal operating mode(s)
c. Containment isolation provision(s)

The isolation signal codes for the alphabetic isolation signal symbols shown are provided at the end.

Any one of the isolation signal(s) shown for a line or group of lines will initiate closure of the isolation valves. Handswitches in the control room are provided for remote-manual control of every isolation valve; however, an isolation cannot be reopened remote-manually until all of the isolation signals have cleared.

1. Nuclear Boiler - Main Steam Lines

   a. Fluid being transferred

      Primary Coolant in the form of steam

   b. Normal operating mode(s)

      During normal plant operation, the main steam lines transter steam from the reactor vessel to the main turbine and auxiliaries.

   c. Containment Isolation Provision(s)

      Redundant pneumatically operating y-pattern globe valves provide containment isolation. There is a motor operated globe valve located in the drain line that is on the outboard valve. These valves will close automatically upon receipt of isolation signals C, D, E, F, N and P

2. Residual Heat Removal - Pump Suction Lines

   a. Fluid being transferred

      Suppression Pool Water is transferred out of the containment during system operation (post-accident) or during system test and is then transferred back into the containment through a closed loop.

(VIII Continued)

b. Normal operating mode(s)

During normal plant operation, these lines are inactive but with the isolation valves open

c. Containment Isolation Provision(s)

Motor-operated valves outside the containment (combined with a closed loop outside the containment) provide the necessary isolation. A handswitch in the control room controls the operation of the isolation valves.

3. Residual Heat Removal (RHR) - Shutdown Cooling Suction

a. Fluid being transferred

Reactor Coolant is transferred out of the containment to the RHR heat exchangers and then is returned by way of a closed loop outside containment to the reactor vessel.

b. Normal operation mode(s)

During normal plant operations, the suction line is isolated. During reactor shutdown this line is used to cooldown the reactor once the reactor vessel pressure is low.

c. Containment Isolation Provision(s)

Motor Operated valves are provided inside and outside the containment. These valves will automatically close upon receipt of isolation signals A, U, and M.

4. Reactor Core Isolation Cooling (RCIC) - Steam Supply to RHR System and to RCIC Turbine

a. Fluid being transferred

Reactor Coolant in the form of steam

b. Normal operating mode(s)

During normal plant operation, this line is pressurized with steam to maintain the line (and the RCIC system) in standby (quick start capability).

c. Containment Isolation Provision(s)

Motor operated gate and globe valves inside and outside the containment provide the necessary isolation. These valves will automatically close when isolation signals J, K, and T are present.

(VIII Continued)

5. Nuclear Boiler - Main Steam Line Drains

   a. Fluid Being transferred

      Reactor coolant in the form of steam and/or water

   b. Normal operating mode(s)

      During normal plant operation, the isolation valves are normally open transferring steam and/or water as required to the main condenser.

   c. Containment Isolation Provision(s)

      Motor operated gate valves inside and outside the containment provide the necessary containment isolation. These valves will automatically close upon receipt of isolation signals C, D, E, F, N and P.

6. High Pressure Core Spray (HPCS) - Pump Suction Line

   a. Fluid being transferred

      Suppression pool water

   b. Normal Operating Mode(s)

      During normal plant operation, the system is inactive. During system operation (during a transient or accident), this valve will open when the condensate storage tank is low.

   c. Containment Isolation Provision(s)

      The suction line isolation valve (together with the closed loop of the system outside containment) provides the necessary containment isolation.

      A handswitch is provided in the control room for operating this valve.

7. Reactor Core Isolation Cooling (RCIC) - Pump Suction

   a. Fluid being transferred

      Suppression Pool Water

   b. Normal operating mode(s)

      During normal plant operation, the pump suction line is inactive with the valve closed. When the RCIC is operating, the valve is also closed except when the condensate storage tank level is low, then this valve will open automatically

c. Containment Isolation Provision(s)

A motor operated gate valve (together with the system closed loop) outside containment provides the necessary containment isolation. A handswitch is provided in the control room to actuate the valve.

8. Low Pressure Core Spray (LPCS) - Pump Suction

a. Fluid being transferred

Suppression pool water is transferred out of the containment during system operation (post-accident) or during system testing and is then transferred back in to the containment through a closed loop.

b. Normal operating mode(s)

During normal plant operation, the LPCS suction is inactive with the isolation valve open.

c. Containment Isolation Provision(s)

A motor-operated valve outside the containment (combined with a closed loop outside the containment) provides the necessary isolation. A handswitch in the control room controls the operation of the isolation valve.

9. Containment Cooling - Containment purge and ventilation air supply and exhaust

a. Fluid being transferred

Air is moved into the containment, is mixed with the containment atmosphere and is the discharged out of the containment.

b. Normal operationg mode(s)

Usually during normal plant operations, these large lines (20" Dia.) are isolated. Less than 1% of the time, these valves will be open.

c. Containment Isolation Provision(s)

The ventilation lines are equipped with air-to-open, spring-to-close butterfly valves that are located both inside and outside the containment. These valves wll close automatically when isolation signals B, G and Z are present.

(VIII Continued)

10. Reactor Water Cleanup (RWCU) - Drain to Main Condenser

    a. Fluid being transferred

       Reactor Water

    b. Normal operating mode(s)

       During normal plant operation, the containment isolation valves will be closed. During plant startup, reactor level swell can be transferred out of the containment to the main condenser.

    c. Containment Isolation Provision(s)

       Motor-operated gate valves located inside and outside the containment provide the necessary containment isolation. Isolation signals B, D, H, L, W, Y will initiate closure of the outboard isolation valve and isolation signals B, D, H, L, Y will initiate closure of the inboard isolation valve

11. Reactor Water Cleanup (RWCU) - Backwash transfer pump discharge to spent resin tank

    a. Fluid being transferred

       Water with 0.8% suspended solids by weight

    b. Normal operating mode(s)

       The isolation valves are normally closed. The valves are opened when transferring the spent resins to the tank which is outside the containment

    c. Containment Isolation Provision(s)

       Pneumatically operated (air-to-open, spring-to-close) gate valves are provided for containment isolation. These valves will automatically close when isolation signals B and G are present.

12. Floor and Equipment Drains - Drywell and Containment Equipment and Floor Drains, and Chemical Waste Sump Pump Discharges.

    a. Fluid being transferred

       Water from equipment and floor drains and the chemical waste

    b. Normal operating mode(s)

       The valves are normally open but water is being transferred periodically (that is, to pump out the sumps)

c. Containment Isolation Provision(s)

Pneumatically operated (air-to-open, spring-to-close) gate valves provide the necessary containment isolation. The valves will close automatically when isolation signals B and G are present.

13. Reactor Water Cleanup (RWCU) - System Return to Feedwater

a. Fluid being transferred

Reactor water

b. Normal operating mode(s)

These containment isolation valves are normally open to provide the system flow path out of the containment to the feedwater line which directs the fluid to the reactor vessel.

c. Containment Isolation Provision(s)

Motor operated gate valves provide the necessary containment isolation. These valves will close automatically when isolation signals B, D, H, L and Y are present.

14. Condensate and Refueling Water Storage and Transfer Lines To and From Upper Containment Pool

a. Fluid being transferred

Pool Water

b. Normal operating mode(s)

During normal plant operation, the isolation valves are locked closed. During shutdown for refueling, these valves are opened to transfer pool water.

c. Containment Isolation Provision(s)

Locked closed manual gate valves provide containment isolation

15. Fuel Pool Cooling and Cleanup - Upper Containment Pool to Fuel Pool Drain Tank

a. Fluid being transferred

Pool Water

b. Normal Operating Mode(s)

The containment isolation valves are opened or closed as required to permit the transfer of the pool water during cleanup of the upper containment pool.

c. Containment Isolation Provision(s)

Motor operated gate valves provide the necessary containment isolation. These valves will close automatically when isolation signals B and G are present.

16. Containment Cooling - Purge air to containment exhaust charcoal filter train and from outside air supply

a. Fluid being transferred

air

b. Normal operating mode(s)

The valves are normally open during plant operation to provide a flow path for the low volume (500 SCFM) purge

c. Containment Isolation Provision(s)

Pneumatically operated (air-to-open, spring-to-close) butterfly valves provide the necessary containment isolation. These valves will automatically close when isolation signals B, G and Z are present

17. Condensate and Refueling Water Storage and Transfer - Refueling Water Transfer Pump Suction

a. Fluid being transferred

Suppression Pool Water

b. Normal operating mode(s)

During normal plant operation, the line is opened to provide the flowpath for suppression pool cleanup system operation

c. Containment Isolation Provision(s)

Pneumatically operated (air-to-open, spring-to-close) butterfly valves provide the necessary containment isolation. These valves will automatically close when isolation signals B and G are present.

18. Reactor Water Cleanup (RWCU) - Pump Suction

a. Fluid being transferred

Reactor Water

b. Normal Operating Mode(s)

During normal plant operation, the pump suction is open to provide a flow path for this system out of the containment to the RWCU pumps

c. Containment Isolation Provision(s)

Motor operated gate valves provide the necessary containment isolation. The inboard isolation valve will close automatically when signals B, D, H, L and Y are present; the outboard isolation valve will close automatically when signals B, D, H, L, W and Y are present.

ISOLATION SIGNAL CODES

Signal	Description
A*	Reactor vessel low water level - level 3. (A scram occurs at this level also. This is the highest of the three isolation low water level signals.)
B*	Reactor vessel low water level - level 2. (This is the second of the three low water level signals. (The RCIC and HPCS systems are initiated at this level.)
C*	Reactor vessel low water level - level 1. (This is the lowest of the three water level signals, and main steam line isolation occurs at this level. THe LPCS and LPCI systems are also initiated at this level.)
D*	High radiation - main steam line
E*	Line break - main steam line (steam line high steam flow)
F*	Line break - main steam line (steam line high space or high differential temperature)
G*	High drywell pressure
H*	Line break in reactor water cleanup system - (high space temperature)
J*	Line break in RCIC system steam line to turbine (low steam line pressure)
K*	Line break in RCIC system steam line to turbine (high steam line space temperature, or high steam flow)
L*	High differential flow in the reactor water cleanup system
M*	Line break in RHR shutdown and head cooling (high space temperature)
N*	Low main condenser vacuum

ISOLATION SIGNAL CODES (Cont.)

P*	Low main steam line pressure at inlet to turbine (RUN mode only)
T	High pressure RCIC turbine exhaust diaphragm
U	High reactor vessel pressure - Close RHR - shut down cooling valves and head cooling valves
W	High temperature at outlet of cleanup system non-regenerative heat exchanger
Y	Standby liquid control system actuated
Z*	High radiation, containment and drywell ventilation exhaust
RM*	Remote manual switch from control room (All automatic initiated isolation valves are capable of remote manual operations from the control room)

* These are the isolation functions of the containment, and reactor vessel isolation control system; other functions are given for information only.

(ATTACHMENT 3)

Mississippi Power & Light Company
Grand Gulf Nuclear Station
Units 1 and 2
(Docket Nos. 50-416 and 50-417)

Response to Bulletins and Orders Task Force Requests
For Additional Information Concerning NEDO-24708
Question Set D

QUESTION 1

With regard to Tables 2.1.4a thru 4.1.4n which provide a description, in matrix form, of system initiation, permi-sives, manual valve lineups, etc. it is noted that additional valves installed by AE are not included. These Tables should be complete. Furthermore are they administratively controlled?

RESPONSE

The statement that additional valves installed by AE are not included is not applicable for Grand Gulf. All valves were included in the analysis for Grand Gulf. Furthermore, all valves are administratively controlled.

QUESTION 2

Discrepancy between Table 2.1-1 and 2.1-2b regarding existence of FWCI for Dresden 1.

RESPONSE

Not applicable for Grand Gulf.

QUESTION 3

In Figures 2.1.2 & 2.1.5, why are turbine stop valves and control valves shown open for RCIC and closed for HPCI System?

RESPONSE

These figures are not applicable for Grand Gulf.

QUESTION 4

Table 2.1-2a under items 1-4, 4-4, and 14-4, it is noted that some plants require on-site AC power for small break protection. Prolonged operation of RCIC & HPCI can require AC powered space coolers. The following information is required:

(a) How long can these systems operate without space coolers?

(b) What is operating temperature limit w/o coolers?

(c) Power source for coolers

(d) What specific components in each system require cooling and temperature limitation on component?

(Attachment 3 Continued)

RESPONSE

a)

RCIC	HPCI	Main F.W. Sys.
Minimum 29 minutes, possibly longer	Not applicable for Grand Gulf	Indefinite

b) 148° F @ 100% Relative humidity for RCIC; unknown for Main F.W. Sys.

c) RCIC: Class IE AC Power (Division I)

HPCI: Not applicable

Main F.W. Sys.: (Cooled by turbine building general area fan coil Units): Onsite - AC Power

d) RCIC: The temperature limiting component in the RCIC room is not known. All equipment in the room is designed to meet the above temperature specification given in b.

Main F.W. pumps - unknown

QUESTION 5

Table 2.1a Item 14-3, Why doesn't CST require power for level indication?

RESPONSE

CST Level indications are powered from on site AC and on site DC.

QUESTION 6

Table 2.1-2a Items 1-8, 2-8, 3-8, 4-8, 5-8, 6-8, 9-8 identify auxiliary systems that may require cooling for long-term operation. Answer questions 4a-d with regard to auxiliary systems.

RESPONSE

ITEM	SYSTEM	COOLING EQUIPMENT
1-8	RCIC	RCIC Room Cooler
2-8	Isolation Condenser	Not Applicable
3-8	HPCS	HPCS Room Cooler
4-8	HPCI	Not Applicable
5-8	LPCS	LPCS Room Cooler
6-8	LPCI*	RHR A, B, or C Room Cooler as applicable
9-8	RHR A -	RHR A Room Cooler
	RHR B -	RHR B Room Cooler
	RHR C -	RHR C Room Cooler
	SSW Pumps -	SSW Pump House Cooling Fans

* Available as a mode of RHR A, 3, or C

(Attachment 3 Continued)

a) RCIC - min. 29 minutes, possibly longer
Isolation Condenser - N/A
HPCS - min. 4.1 minutes, possible longer
HPCI - N/A
LPCS - min 9 minutes, possibly longer
LPCI* - RHRA - min. 10.3 minutes, possibly longer
RHRB - min. 10.3 minutes, possibly longer
RHRC - min. 15.6 minutes, possibly longer
RHRA - min. 7.7 minutes, possibly longer
RHRB - min. 7.7 minutes, possibly longer
RHRC - min. 15.6 minutes, possibly longer
SSW - min. 1.2 minutes, possibly longer

* Availabe as a Mode of RHR A, B, or C

b) RCIC, HPCS, LPCS, LPCI*, RHRA, RHRB, RHRC - 148° F @ 100% Relative Humidity

SSW - 104° F, possibly higher

* Available as a mode of RHR A, B, or C.

c) RCIC - Class IE AC Power (Division I)
Isolation Condenser - N/A
HPCS - Class IE AC Power (Division III)
HPCI - N/A
LPCS - Class IE AC Power (Division I)
HPCI* - RHRA - Class IE AC Power (Division I)
RHRB - Class IE AC Power (Division II)
RHRC - Class IE AC Power (Division II)
SSW Pumphouse: Basin A - Class IE AC Power (Division I)
Basin B - Class IE AC Power (Division II)

d) RCIC, HPCS, LPCS, LPCI*, RHRA, RHRB, RHRC - the temperature limiting component in these rooms is not known. All components in each room is designed to meet the above temperature specification given in b.
SSW Pumphouse - Rated temp. rise of SSW pump motors

QUESTION 7

Table 2.1-2a Item 14-8. What are requirements for feed pump ventilation system? Answer questions 4A-d with regard to this system.

RESPONSE

Feed Pump Ventilation System is not applicable to Grand Gulf.

(Attachment III Continued)

QUESTION 8

Table 2.1-2a column 9b power source list is incomplete. Should identify AC requirements and if on-site or off-site, i.e., power source for auxiliary systems not identified.

RESPONSE

See the attached modified page from Table 2.1-2a which has been changed to reflect Grand Gulf System Design Information in response to this question. Column 8b shows the power source for auxiliary systems; and column 9b shows the power source for automatic startup logic. Power sources for pump room coolers is provided with the response to Question 6.

QUESTION 9

Table 2.1-2a and 2.1-2b Column 11, manual actions required and how long they take is a short-term item that was not addressed.

RESPONSE

Column 11 should be headed "Manual Initiation of the System Done in the Control Room. If not, what actions are required and how long do they take"?

In a meeting with the BWR Owners Group (7/12/79 in San Jose, California) NRC indicated that what was desired was the manual actions outside the control room. Actions performed in the control room are accomplished in a very short period of time (~1 min.).

Table 2.1-2a (Modified)

SYSTEM DESIGN INFORMATION - GRAND GULF

System	8a Auxiliary Systems Required for Operation X-8	8b Power Source	9a Automatic Startup Logic Note X-9a	9b Power Source
1. RCIC	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2	On Site DC
2. Isolation Condenser	System is N/A for Grand Gulf			
3. HPCS	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2 Hi Drywell, 1x2x2	On Site DC
4. HPCI	System is N/A for Grand Gulf			
5. LPCS	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2 Hi Drywell Pres., 1x2x2	On Site DC
6. LPCI	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2 Hi Drywell Press., 1x2x2	On Site DC
7. ADS	None	N/A	Lo Level H_2O, 2x2 or 2x2 Hi Drywell Press., 2x2 or 2x2 (Note 7-9a)	On Site DC
8. SRV	None	N/A	N/A	N/A
9. RHR - incl. shutdown, cooling, stm. cond., supp. pool cooling, cont. spray modes	Standby service water (Note 1-8)	On Site AC	N/A (Note 9-9a)	N/A
10. SSW	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2 Hi Drywell Press 1x2x2 RHR Pump Start LPCS Pump Start Diesel Gen. Start RCIC Turbine Start	On Site DC

Table 2.1-2a (Modified)

SYSTEM DESIGN INFORMATION - GRAND GULF

System	8a Auxiliary Systems Required for Operation X-8	8b Power Source	9a Automatic Startup Logic Note X-9a	9b Power Source
11. CCW	Plant Service Water (Note 1-8)	Off Site AC	N/A	N/A
12. CRDS	CCW	Off Site AC	N/A	N/A
13. CST	None	N/A	N/A	N/A
14. Main Fd. Wtr. Sys.	Condensate, TBCCW, Plant Service Water	Off Site AC	N/A	N/A
15. Recircu. Pump/Motor Cooling Sys.	System is N/A for Grand Gulf			

(Attachment 3 Continued)

QUESTION 10

Table 2.1-2a Column 12, there appears to be an inconsistency between note I-12 which states that logic system functional tests and surveillance testing of systems may impede systems for auto initiating and response as given in Column 12.

RESPONSE

For RCIC, HPCS, LPCS, LPCI and other modes of RHR, the system may be made temporarily inoperable during logic system testing. The logic system test may prevent auto-initiation of the system. However, automatic features indicate this loss of system availability to the operator, and administrative procedures do not allow simultaneous testing of more than one ECCS logic system. Once the ECCS auto-initiation signal has been received, the ECCS mode will override any other mode of the system in effect at time of initiation.

QUESTION 11

Table 2.1-2a Column 13, inconsistency between response and notes. Plants for which operation is performed should be identified. Also for ADS doesn't operator eventually have to close ADS valves?

RESPONSE

Attached is a modification of Column 13 from Table 2.1-2a showing system design information applicable to Grand Gulf.

No operator action is required to close the ADS valves.

Table 2.1-2a (Modified)
SYSTEM DESIGN INFORMATION - GRAND GULF

	System	13 Actions Performed by the Operator for System Operation and Control after Initiation of the System Within Two Hours
1.	RCIC	None (Note 1-13)
2.	Isolation Condenser	System N/A for Grand Gulf
3.	HPCS	None (Note 3-13)
4.	HPCI	System N/A for Grand Gulf
5.	LPCS	None (Note 5-13)
6.	LPCI	None (Note 6-13)
7.	ADS	None
8.	SRV	None
9.	RHR-incl. shutdown Cooling, Stm. Cond., supp. Pool Cooling, Cont. Spray modes.	N/A (Note 9-9a) (Note 9-13)
10.	SSW	None (Note 10-13)
11.	CCW	N/A
12.	CRDS	(Note 12-13)
13.	CST	N/A
14.	Main Feedwater System	N/A
15.	Recirc. Pump/Motor Cooling System	System N/A for Grand Gulf

Table 2.1-2a (Modified)
SYSTEM DESIGN INFORMATION - GRAND GULF
COLUMN 13 - NOTES

1-13	RCIC flow is manually controlled once level recovers. If RCIC trips, turbine must be reset locally.
3-13	Injection valve closes on hi Reactor Water Level if hi Drywell pressure is cleared. Reopening requires Reactor Lo Water Level or valve switch to open.
5-13	LPCS Flow is manually controlled once level recovers.
6-13	LPCI flow is manually controlled once level recovers. LPCI Heat Exchange Bypass Valve can be closed after 10 min time delay.
9-9a	BWR 6 has automatic initiation of containment spray on high containment pressure.
9-13	Containment spray requires manual shutdown. Suppression Pool Cooling may be needed about 1½ hours later.
10-13	Manipulations required to prevent crosstie to other systems on regaining offsite power.
12-13	Verify control rods full in.

QUESTION 12

Table 2.1-2a & 2.1-2b Column 17c. Identify size debris strainer will allow to pass instead of just starting strainer size is coarse.

RESPONSE

Attached is a modification of column 17 a, b, and c from Table 2.1-2a showing System Design Information applicable to Grand Gulf.

QUESTION 13

Table 2.1-2a, for note X-24 clarify what is meant by indirect indication on manual valves. Also identify which plants comments applicable to.

RESPONSE

This note is not applicable to Grand Gulf.

QUESTION 14

Table 2.1-2a, there appears to be an inconsistency between "no" responses in Column 25 and Note X-25.

RESPONSE

This note is not applicable to Grand Gulf.

QUESTION 15

Table 2.1-2a, Column 26, identify other means of detecting leaking SRV.

RESPONSE

A leaking SRV may also be detected by an increasing suppression pool temperature.

Table 2.1-2a (Modified)
SYSTEM DESIGN INFORMATION - GRAND GULF

	System	17a Strainers in System	17b Strainer Location	17c Strainer Size
1.	RCIC	Yes	Suppression Pool Suction	0.1" opening
2.	Isolation Condenser	(System	N/A to Grand Gulf)	
3.	HPCS	Yes	Suppression Pool Suction	0.1" opening
4.	HPCI	(System	N/A to Grand Gulf)	
5.	LPCS	Yes	Suppression Pool Suction	0.1" opening
6.	LPCI	Yes	Suppression Pool Suction	0.1" opening
7.	ADS	N/A	N/A	N/A
8.	SRV	N/A	N/A	N/A
9.	RHR - incl. shut-down cooling, stm. supp. pool cooling, cont. spray modes	Yes	Suppression Pool Suction	0.1" opening
10.	SSW	No	N/A	N/A
11.	CCW	No	N/A	N/A
12.	CRDS	No	N/A	N/A
13.	CST	No	N/A	N/A
14.	Main Feedwater System	Yes (Note 14-17a)	Turbine Bldg. (Note 14-17b)	Coarse/60 mesh
15.	Recirc pump/motor cooling system	(System	N/A to Grand Gulf)	

Table 2.1-2a (Modified)
SYSTEM DESIGN INFORMATION - GRAND GULF

Column 17 - Notes

14 - 17a 14 - 17b	Coarse screens are located in condenser on condensate pumps suction lines. Also strainers located in condensate cleanup system.

(Attachment 3 Continued)

QUESTION 16

Table 2.1-2a, and 2.1-2b, response incomplete. Would like to know plants that perform independent procedure verification and which do physical verification and if there is any significant differences in performance.

RESPONSE

Note X-28b would read as follows to apply to Grand Gulf:

X-28b - Operations personnel are required to perform an independent verification by physically checking all test line ups and restoration to normal for all safety systems.

QUESTION 17

Table 2.1-1 shows Dresden I does not have ADS or FWCI. Table 2.1-2b indicates it does. Also Table 2.1-1 shows HB does not have LPCI, Table 2.1-2b indicates it does.

RESPONSE

Not applicable to Grand Gulf

QUESTION 18

Table 2.1-2b, note 2-8, how long can isolat n condenser remove heat without makeup?

RESPONSE

Not applicable to Grand Gulf

QUESTION 19

Table 2.1-2b, Column 9a, why does core spray have to be operating to use ADS for Humboldg Bay?

RESPONSE

Not applicable for Grand Gulf

QUESTION 20

Table 2.1-2b, Column 13 and 15b: What is meant by N/A for operator action under FWCI? Also not 4-15b missing.

RESPONSE

Not applicable for Grand Gulf

(Attachment 3 Continued)

QUESTION 21

Table 2.1-2b column 15c, why is there no dedicated capacity specified for HPCI?

RESPONSE

Not applicable for Grand Gulf

QUESTION 22

Table 2.1-2b, Column 13, isn't operator action required to close ADS valves? Also, why is operator action under FWCI for D-1 not applicable?

RESPONSE

Operator action is not required to close ADS valves. FWCI is N/A for Grand Gulf.

QUESTION 23

Tables 2.1-4 for systems such as LPCI, LPCS and HPCS. Are there no trips on component malfunctions, i.e., high pump bearing temperatures or loss of coolant to pump bearing.

RESPONSE

See attached modification of Tables 2.1-4c, 2.1-4f, and 2.1-4G showing information applicable to Grand Gulf.

Table 2.1-4c (Modified)
HIGH PRESSURE CORE SPRAY SYSTEM (HPCS)
(APPLIES TO GRAND GULF)

Initiation	Permissive	Trip Conditions	Degraded Conditions: Reduced Capacity	Degraded Conditions: Inoperable	Comments
. Reactor Vessel Level Trip . High Drywell Pressure . Manual Initiation	. None	System Trips . Reactor Vessel water level . Manual Trip Diesel Trips (Any operating Condition) . Overspeed at 105% . Manual switch (Brkr control) . Three phase fault (differential relay) Motor Trips . Overcurrent . Overfrequency	. Return line to suppression pool open . Return line to condensate storage tank open . Relief valve suppression return open	. Logic power failure . Pump mtr. power failure (off-site + diesel) . Complete pipe blockage . Condensate storage tank empty and transfer to suppression pool blocked	. This is a single channel system.

Table 2.1-4f (Modified)
LOW PRESSURE CORE SPRAY SYSTEM
(APPLIES TO GRAND GULF)

Initiation	Permissive	Trip Conditions	Degraded Conditions: Reduced Capacity	Degraded Conditions: Inoperable	Comments
. Low Vessel Water Level . High Drywell Pressure . Manual Initiation	Reactor Pressure Low	System Trip . Manual switches Motor Trip . Overcurrent . Ground . ESF bus load shedding	. Bypass test line to suppression pool open Safety valve open to suppression pool	. Loss of off site power + diesel generator failure . Complete flow blockage . Logic power failure	This is a single division system

Table 2.1-4g (Modified)
LOW PRESSURE COOLANT INJECTION SYSTEM (MODE OF RHR)
(APPLIES TO GRAND GULF)

Initiation	Permissive	Trip Conditions	Degraded Conditions: Reduced Capacity	Degraded Conditions: Inoperable	Comments
. High Drywell Pressure . Reactor Water Low Level Trip . Manual Switches	. Reactor low pressure	System Trip . Manual switches Motor Trip . Overcurrent . Ground . ESF bus load shedding	. Single Pump trip . Injection valves not opening . Containment/ spray cooling valves not closing . Min. flow bypass valve not closing . Divisional motive power failure (offsite + diesel) . Divisional logic power bus failure . Test return line to suppression pool open	. Motive power failure in both divisions (off-site + diesel) . Complete flow blockage . Loop selection failure, if applicable	. This is a two divisional redundant system. Either system is capable of providing sufficient core cooling requirements.

QUESTION 24

Table 2.1-4d, what is source of auto isolation signal identified under trip conditions?

RESPONSE

Not applicable for Grand Gulf

QUESTION 25

Table 2.1-4m&n identify turbine and pump protection trips. Table 2.1-4m under degraded conditions, reduced capacity, what is significance of term "Open"?

RESPONSE

See attached modification of Table 2.1-4N-1 showing information applicable to Grand Gulf.

The term "open" is not applicable to Grand Gulf

QUESTION 26

Table 2.1-5e, since Dresden I will not become operational without HPCI, shouldn't table reflect this? Also, FWCI should be included.

RESPONSE

Not applicable to Grand Gulf

QUESTION 27

Table 2.1-5g & 2.1-5i. One diesel generator out of service missing from matrix.

RESPONSE

Not applicable to Grand Gulf

Table 2.1-4N-1 (Modified)
FEEDWATER CONTROL SYSTEM (TURBINE DRIVEN PUMP)
(APPLIES TO GRAND GULF)

Initiation	Permissive	Trip Conditions	Degraded Conditions: Reduced Capacity	Degraded Conditions: Inoperable	Comments
. Continuously operates	. Main condenser vacuum	. Reactor vessel level trip . Turbine and pump protection trips . Manual . Overspeed . Low bearing oil pressure (pump or turbine) . Low condenser vacuum . Thrust bearing wear . Pump suction pressure low . Pump discharge pressure high . Pump flow low (less than minimum recirc).	. One of two injection lines becomes blocked . Restricted steam line flow to turbine . Lack of manual reset inhibits automatic function	. Power Failure a) logic b) loss of off-site power . Condensate pumps or condensate booster pumps not operating . Complete flow blockage	. This is a non-essential system

(Attachment 3 Continued)

QUESTION 28

Table 2.1-5j. For Humboldt Bay does one or both ADS valves have to be out of service for plant to be shutdown

RESPONSE

Not applicable to Grand Gulf

QUESTION 29

Table 2.1-4b. Under inoperable status failure to manually reset to start on low water level not included.

RESPONSE

Not applicable to Grand Gulf

QUESTION 30

Table 2.1-2a, Column 8. Isn't service air required as an auxiliary system to operate the main feedwater system?

RESPONSE

Instrument air is used to close the minimum flow recirc valves and to operate the Startup Bypass Valve and Cleanup recirculation valve.

QUESTION 31

Table 2.1-2b, Column 9. Does AC refer to on-site?

RESPONSE

Not applicable to Grand Gulf

QUESTION 32

Table 2.1-2a, Column 16d. For small break is AWS required for manual operation of backup water source sufficient to prevent core uncovery if HPCI or HPCS not available?

RESPONSE

This question is currently being reviewed by General Electric and the owners group as a part of emergency procedure guidelines.

Operator guidelines will be prepared regarding ADS initiation to ensure adequate core cooling.

QUESTION 33

Rad monitor for isolation condenser.

RESPONSE

Not applicable for Grand Gulf

(Attachment 4)
Mississippi Power & Light Company
Grand Gulf Nuclear Station
Units 1 and 2
(Docket Nos. 50-416 and 50-417)

Response to Bulletins and Orders Task Force Requests For Additional Information Concerning NEDO-24708 Question Set E

QUESTION 1

According to section 3.1.1.1.2.1.6 of NEDO-24708, LPCS or LPCI must be throttled by the operator, for some plants, to insure adequate NPSH. Can these lines be orificed to achieve the same goal without compromising the adequacy of the system(s)? What are the consequences of not throttling?

RESPONSE

Not applicable for Grand Gulf.

QUESTION 2

Notes 5-8, 6-8 and 9-8 for Table 2.1-2a state that some plants require lube oil and seal cooling. Which plants does this refer to?

RESPONSE

Not applicable for Grand Gulf.

QUESTION 3

With regard to Table 2.1.4a thru 2.1.4n which provide a description, in matrix form, of system initiation, permissives, manual valve lineups, etc., it is noted that additional valves installed by AE are not included. These Tables should be complete. Furthermore are they administratively controlled?

RESPONSE

The statement that additional valves installed by AE are not included is not applicable for Grand Gulf. All valves were included in the analysis for Grand Gulf. Furthermore, all valves are administratively controlled.

QUESTION 4

Table 2.1-2a under Items 1-4, 4-4, and 14-4, it is noted that some plants require on-site AC power for small break protection. Prolonged operation of RCIC & HPCI can require AC powered space coolers. The following information is required:

(a) How long can these systems operate without space coolers?
(b) What is operating temperature limit w/o coolers?
(c) Power source for coolers
(d) What specific components in each system require cooling and temperature limitation on component?

(Attachment 4 Continued)

RESPONSE

a) RCIC	HPCI	Main F. W. System
Minimum 29 minutes, possibly longer	Not applicable for Grand Gulf	Indefinite

b) 148° F @ 100% Relative humidity for RCIC. Unknown for Main F. W. System.

c) RCIC: Class IE AC Power (Division I)

HPCI: Not Applicable

Main F. W. Sys.: (Cooled by Turbine Building General Area Fan Coil Units): On Site - AC Power

d) RCIC: The temperature limiting component in the RCIC room is not known. All equipment in the room is designed to meet the above temperature specifications given in b.

Main F. W. pumps: unknown

QUESTION 5

Table 2.1-2a Items 1-8, 2-8, 3-8, 4-8, 5-8, 6-8, 9-8 identify auxiliary systems that may require cooling for long-term operation. Answer questions 4a-d with regard to auxiliary systems.

RESPONSE

ITEM	SYSTEM	COOLING EQUIPMENT
1-8	RCIC	RCIC Room Cooler
2-8	Isolation Condenser	Not Applicable
3-8	HPCS	HPCS Room Cooler
4-8	HPCI	Not Applicable
5-8	LPCS	LPCS Room Cooler
6-8	LPCI*	RHR A, B or C Room Cooler, As Applicable
	RHR B	RHR B Room Cooler
	RHR C	RHR C Room Cooler
	SSW Pumps	SSW Pumphouse Cooling Fans

* Available as a Mode of RHR A, B, or C.

a) RCIC - min. 29 minutes, possibly longer
ISO. Condenser - N/A
HPCS - min. 4.1 minutes, possibly longer
HPCI - N/A
LPCS - min. 9 minutes, possibly longer
LPCI* - RHR A - min. 10.3 minutes, possibly longer

(Attachment 4 Continued)

RHRB - min. 10.3 minutes, possibly longer
RHRC - min. 15.6 minutes, possibly longer
RHRA - min. 7.7 minutes, possibly longer
RHRB - min 7.7 minutes, possibly longer
RHRC - min. 15.6 minutes, possibly longer
SSW - min. 1.2 minutes, possibly longer

* Available as a Mode of RHR A, B, or C

b) RCIC, HPCS, LPCS, LPCI*, RHRA, RHRB, RHRC - 148° F @ 100% Relative humidity

SSW - 104° F, possibly higher

* Available as a mode of RHR A, B, or C.

c) RCIC - Class IE AC Power (Division I)
Isolation Condenser - N/A
HPCS - Class IE AC Power (Division III)
HPCI - N/A
LPCS - Class IE AC Power (Division I)
HPCI* - RHRA - Class IE AC Power (Division I)
RHRB - Class IE AC Power (Division II)
RHRC - Class IE AC Power (Division II)
SSW Pumphouse: Basin A - Class IE AC Power (Division I)
Basin B - Class IE AC Power (Division II)

d) RCIC, HPCS, LPCS, LPCI*, RHRA, RHRB, RHRC - the temperature limiting component in these rooms is not known. All components in each room is designed to meet the above temperature specification given in b.
SSW Pumphouse - Rated temp. rise of SSW pump motors.

(Attachment 4 Continued)

QUESTION 6

Table 2.1-2a column 9b power source list is incomplete. Should identify AC requirements and if on-site or off-site, i.e., power source for auxiliary systems not identified.

RESPONSE

See the a tached modified page from Table 2.1-2a which has been changed to reflect Grand Gulf System Design Information in response to this question. Column 8b shows the power source for auxiliary systems; and column 9b shows the power source for automatic startup logic. Power sources for pump room coolers is provided with the response to above question.

QUESTION 7

Table 2.1-2a and 2.1-2b column 11, manual actions required and how long they take is a short term item that was not addressed.

RESPONSE

Column 11 should be headed "Manual Initiation of the system Done in the Control Room. If not, what actions are required and how long do they take".

In a meeting with the BWR owners group (7/12/79 in San Jose, Cal.) NRC indicated that what was desired was the manual actions outside the control room. Actions performed in the control room are accomplished in a very short period of time (~1 min.).

QUESTION 8

Table 2.1-2b. note 2-8, how long can insolation condenser remove heat without make up?

RESPONSE

Not applicable to Grand Gulf

QUESTION 9

Tables 2.1-4 for systems such as LPCI, LPCS, and HPCS. Are there not trips on component malfunctions, i.e., high pump bearing temperatures or loss of coolant to pump bearing.

Table 2.1-2a (Modified)

SYSTEM DESIGN INFORMATION - GRAND GULF

System	8a Auxiliary Systems Required for Operation X-8	8b Power Source	9a Automatic Startup Logic Note X-9a	9b Power Source
1. RCIC	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2	On Site DC
2. Isolation Condenser	System is N/A for Grand Gulf			
3. HPCS	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2 Hi Drywell, 1x2x2	On Site DC
4. HPCI	System is N/A for Grand Gulf			
5. LPCS	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2 Hi Drywell Pres., 1x2x2	On Site DC
6. LPCI	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2 Hi Drywell Press., 1x2x2	On Site DC
7. ADS	None	N/A	Lo Level H_2O, 2x2 or 2x2 Hi Drywell Press., 2x2 or 2x2 (Note 7-9a)	On Site DC
8. SRV	None	N/A	N/A	N/A
9. RHR - incl. shutdown, cooling, stm. cond., supp. pool cooling, cont. spray modes	Standby service water (Note 1-8)	On Site AC	N/A (Note 9-9a)	N/A
10. SSW	None (Note 1-8)	N/A	Lo Level H_2O, 1x2x2 Hi Drywell Press 1x2x2 RHR Pump Start LPCS Pump Start Diesel Gen. Start RCIC Turbine Start	On Site DC

Table 2.1-2a (Modified)

SYSTEM DESIGN INFORMATION - GRAND GULF

System	8a Auxiliary Systems Required for Operation X-8	8b Power Source	9a Automatic Startup Logic Note X-9a	9b Power Source
11. CCW	Plant Service Water (Note 1-8)	Off Site AC	N/A	N/A
12. CRDS	CCW	Off Site AC	N/A	N/A
13. CST	None	N/A	N/A	N/A
14. Main Fd. Wtr. Sys.	Condensate, TBCCW, Plant Service Water	Off Site AC	N/A	N/A
15. Recircu. Pump/Motor Cooling Sys.	System is N/A for Grand Gulf			

(Attachment 4 Continued)

RESPONSE

See attached modification of Tables 2.1-4c, 2.1-4f, and 2.1-4g showing information applicable to Grand Gulf.

Table 2.1-4c (Modified)
HIGH PRESSURE CORE SPRAY SYSTEM (HPCS)
(APPLIES TO GRAND GULF)

Initiation	Permissive	Trip Conditions	Degraded Conditions: Reduced Capacity	Degraded Conditions: Inoperable	Comments
. Reactor Vessel Level Trip . High Drywell Pressure . Manual Initiation	. None	System Trips . Reactor Vessel water level . Manual Trip Diesel Trips (Any operating Condition) . Overspeed at 105% . Manual switch (Brkr control) . Three phase fault (differential relay) Motor Trips . Overcurrent . Overfrequency	. Return line to suppression pool open . Return line to condensate storage tank open . Relief valve to suppression pool return open	. Logic power failure . Pump mtr. power failure (off-site + diesel) . Complete pipe blockage . Condensate storage tank empty and transfer to suppression pool blocked	. This is a single channel system.

Table 2.1-4f (Modified)
LOW PRESSURE CORE SPRAY SYSTEM
(APPLIES TO GRAND GULF)

Initiation	Permissive	Trip Conditions	Degraded Conditions: Reduced Capacity	Degraded Conditions: Inoperable	Comments
. Low Vessel Water Level . High Drywell Pressure . Manual Initiation	Reactor Pressure Low	System Trip . Manual switches Motor Trip . Overcurrent . Ground . ESF bus load shedding	. Bypass test line to suppression pool open . Safety valve open to suppression pool	. Loss of off site power + diesel generator failure . Complete flow blockage . Logic power failure	This is a single division system

Table 2.1-4g (Modified)
LOW PRESSURE COOLANT INJECTION SYSTEM (MODE OF RHR)
(APPLIES TO GRAND GULF)

Initiation	Permissive	Trip Conditions	Degraded Conditions: Reduced Capacity	Degraded Conditions: Inoperable	Comments
. High Drywell Pressure . Reactor Water Low Level Trip . Manual Switches	. Reactor low pressure	System Trip . Manual switches Motor Trip . Overcurrent . Ground . ESF bus load shedding	. Single Pump trip . Injection valves not opening . Containment/ spray cooling valves not closing . Min. flow bypass valve not closing . Divisional motive power failure (offsite + diesel) . Divisional logic power bus failure . Test return line to suppression pool open	. Motive power failure in both divisions (off-site + diesel) . Complete flow blockage . Loop selection failure, if applicable	. This is a two divisional redundant system. Either system is capable of providing sufficient core cooling requirements.

(Attachment 4 Continued)

QUESTION 10

One of the systems requests for information that has not been adequately addressed in NEDO-24708 is the loss of feedwater transient coupled with a stuck open SRV and loss of offsite power and diesels. From the information provided it is not possible to determine what the end result of this scenario would be. Since all the plants have various combinations of HPCI, RCIC and IC systems, SRV with varying relieving capacities, and varying stored energies, the results are plant specific. Therefore, for all the plants or plant types identified in NEDO-24708, provide the following time dependent plots for the above scenario:

a) steam and coolant inventory lost
b) coolant temperature and pressure
c) coolant makeup (where applicable)
d) reactor vessel water level relative to top of active fuel
e) fuel and cladding temperatures

The initial plant conditions assumed in the analyses, the time assumed for startup of the available systems and the time the RCIC and HPCI can operate before the system depressurizes below their operating conditions should be provided. In addition, identify when equilibrium conditions are achieved (core covered and water level maintained in normal operating range); if core uncovery occurs identify when, time duration, and extent of core damage (include basis).

RESPONSE

To be submitted by General Electric on behalf of the BWR Owners Group.