



MISSISSIPPI POWER & LIGHT COMPANY

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JAMES P. McGAUGHY, JR.
ASSISTANT VICE PRESIDENT

October 9, 1981

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

Attention: Mr. Harold R. Denton

Dear Mr. Denton:

Subject: Grand Gulf Nuclear Station
Unit 1
Docket 50-416
File 0260/0651
Fuel Load/Startup Testing
AECM-81/393

At the present time, Grand Gulf Nuclear Station is in the preoperational testing process with initial fuel loading scheduled for December 31, 1981.

As stated in the Grand Gulf Final Safety Analysis Report (FSAR) and as noted in our Safety Evaluation Report (SER), NUREG-0831, the possibility of conducting preoperational testing after fuel loading has always been considered. The concept of preoperational testing is predicated on testing, to the extent feasible, each completed system under actual or simulated operating conditions to verify performance of plant structures, systems and components. This testing is to provide assurance that initial fuel loading, approach to criticality, and subsequent power operations can be performed safely.

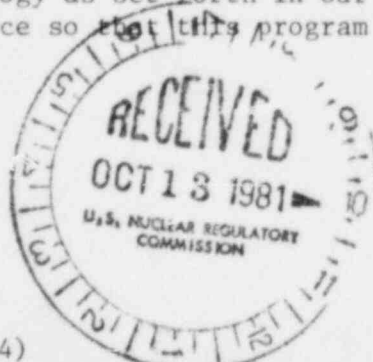
We therefore propose the use of a phased preoperational testing program whereby each completed system is preoperationally tested prior to being placed in service and prior to being required to support any safety-related function or operation. As our FSAR requires in such case, we are now providing you with notification of our intent to use this methodology and with a justification thereof.

Attachment I provides the general approach to be used; Attachment II describes the six startup phases; Attachment III denotes the plant systems required for initiating each startup phase; and, the justification for this post fuel load preoperational testing program, on a per system basis, is provided in Attachment IV.

Having thus provided both the notification and justification for the use of this methodology as set forth in our FSAR, we respectfully request your timely review and concurrence so that this program may be implemented without delay.

Very truly yours,

Boo!
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JPM/js

Attachments (4)

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Member Middle South Utilities System

Mr. H. R. Denton
NRC

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

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GRAND GULF PHASED PREOPERATIONAL/STARTUP CONCEPT

The Startup Program for Grand Gulf Nuclear Station has been divided into six phases (Attachment II) which range from Fuel Load to 100% Power. All plant systems have been reviewed against each phase to determine which systems must be completed (preoperationally tested and released for operation) to insure the safety, reliability and integrity of the plant during startup. Each system has been reviewed against the Grand Gulf Technical Specifications for compliance in the various modes of operation. This review indicated only one (1) minor area of deviation from the Technical Specifications and that is Section 3.6.6.3 (Core Alteration as it Applies to Secondary Containment), Integrity during Initial Fuel Load. With no irradiated fuel, we do not consider this to be of significance and, therefore, request a waiver.

Systems required to be operational prior to each phase of the startup are shown on Attachment III. Thus, prior to the start of the last two phases, all systems are required to be completed. The rationale or justification for not requiring the completion of certain preoperation tests is contained in Attachment IV. As stated, this approach will allow MP&L to concentrate its manpower and expertise on the completion of systems at Grand Gulf in an orderly and timely manner.

PLANT STATUS OR STARTUP PHASES

For the purposes of the parallel preoperational test and startup activities, the Operating Modes and associated Plant Conditions are defined in the following plant phases:

- Phase 1 Plant at Fuel Load, mode switch locked in refuel mode, all refuel interlocks operable, reactor subcritical, vessel head removed, moderator temperature less than 212°F.
- Phase 2 Reactor in startup mode to less than 1% thermal power and low BWR Power Physics Testing. Moderator temperature less than 212°F, vessel head removed.
- Phase 3 Reactor thermal power greater than 1% but less than 25% thermal power.
- Phase 4 Reactor thermal power greater than 25% but less than 50% thermal power.
- Phase 5 Reactor thermal power greater than 50% but less than 75% thermal power.
- Phase 6 Reactor thermal power greater than 75%.

- NOTES:
- 1. Systems will be preoperationally tested and transferred to Plant Staff prior to beginning each denoted phase. All outstanding punchlist items, if any, will be reviewed and accepted by the PSRC to insure safety and regulatory compliance.
 - 2. Prior to going from one phase to another Startup phase, all delineated startup test requirements must be complete and signed off, and reviewed by PSRC.

GGNS SYSTEM/PHASE MATRIX

ATTACHMENT III

DESCRIPTION	1	2	3	4	5	6	DESCRIPTION	1	2	3	4	5	6
1 1B21 Nuclear Boiler System	X						13 1C87 Loose Parts Monitor System			X			
2 1B33 Reactor Recirculation	X						14 1C91 NSSS Process Computer		X				
3 1C11 CRD Hydraulic System	X						15 1D17 Main Steam Line Radiation Mont.			X			
4 1C11 Rod Control Information System	X						16 1D17 Off Gas Radiation Monitoring			X			
5 1C34 Feedwater Control			X				17 1D17 Ventilation Radiation Mont.	X					
6 1C41 Standby Liquid Control System	X						18 1D17 Liquid Process Radiation Mont.	X					
7 1C51 Startup Range Monitoring	X						19 1D21 Area Radiation Monitoring Turbine Bldg. All Other Bldg.	X	X				
8 1C51 Power Range Monitoring		X					20 1D23 Drywell Radiation Monitoring						
9 1C51 Traversing Incore Probe			X				21 1E12 Residual Heat Removal System	X					
10 1C71 Reactor Protection System	X						22 1E21 Low Pressure Core Spray System	X					
11 1C83 Plant Security System	X						23 1E22 High Pressure Core Spray System	X					
12 1C85 Seismic Instrumentation	X						24 1E30 Suppression Pool Make-up System		X				

GGNS SYSTEM/PHASE MATRIX

DESCRIPTION	1	2	3	4	5	6	DESCRIPTION	1	2	3	4	5	6
25 1E32 MSIV Leakage Control System			X				37 SG18 Solid Radwaste Sys. Handling	X					
26 1E51 Reactor Core Isolation Cooling			X				38 1G33 Reactor Water Cleanup	X					
27 1E61 Combustible Gas Control System			X				39 1G41 Fuel Pool Cooling & Cleanup			X			
28 1E71 Integrated ECCS & LOSP	X						40 1L21 125 V ESF Batt., Chrgr., & Dist.	X					
29 1F11 Fuel Handling Equipment	X						41 1M41 Containment Cooling System	X					
30 1F11 Horizontal Fuel Trans. Sys.	X						42 1M51 Drywell Cooling System	X					
31 1F15 Refueling & Vessel Servicing	X						43 1M71 Deleted						
32 SG17 (Equip. Drains) Liquid Radwaste System	X						44 1N64 Offgas System Offgas Cooler Vault			X	X		
33 SG17 (Chem. Waste) Liquid Radwaste System			X				45 1P41 Standby Service Water	X					
34 SG17 (Floor Drains) Liquid Radwaste System	X						46 1P42 Component Cooling Water	X					
35 SG17 (RWCU Waste) Liquid Radwaste System	X						47 1P53 Instrument Air System	X					
36 SG18 Solid Radwaste Sys. Processing			X				48 1P64 Fire Protection System	X					

GGNS SYSTEM/PHASE MATRIX

DESCRIPTION	1	2	3	4	5	6	DESCRIPTION	1	2	3	4	5	6
49 1P64 (Halon System) Fire Protection System	X						61 1R61 Radio Communication Sys.	X					
50 1P64 (CO ₂ System) Fire Protection System	X						62 1R61 - Plt. Comm. Public Address, Intercom System	X					
51 1P75 Standby Diesel Generator Sys.	X						63 1T31 - Aux. Bldg. New Fuel/ Spent Fuel Cask Crane	X					
52 1P75 Standby D/G Fuel Oil System	X						64 1T42 Fuel Handling Area Ventilation	X					
53 1P75 Standby D/G Starting Air Sys.	X						65 1T48 Standby Gas Treatment System			X			
54 1P75 Standby D/G Integ. Sequencing	X						66 SV41 Radwaste Building Ventilation	X					
55 1P81 HPCS Diesel Generator	X						67 1P81 Integrated Testing of HPCS	X					
56 1P81 Diesel Fuel	X						68 SZ51 Control Room HVAC System	X					
57 1P81 HPCS D/G Prototype Qual. Test	X						69 1Z77 - Safeguard Switchgear and Batt. Room Vent. System	X					
58 1R20 ESF 480 VAC	X						70 1Z92 Control Room & Emergency Lighting	X					
59 1R21 ESF 4.16 KV	X						71 1X77 D. G. Bldg. Vent	X					
60 1R21 Load Shed & Sequencing Panel	X						72 1C86 Vibration Monitoring System						

GGNS SYSTEM/PHASE MATRIX

DESCRIPTION	1	2	3	4	5	6	DESCRIPTION	1	2	3	4	5	6
73 1C91 BOP Process Computer	X						85 1N32 Turbine Control			X			
74 1L20 24V Power Supply	X						86 1N33 - Main & RFP Turbine Seal Steam & Drains			X			
75 1L21 - 125/250 VDC Batt., Chrgs, & Distribution	X						87 1N34 Lube Oil Storage & Conditioning			X			
76 1L62 120/240 VAC UP S Inverters	X						88 1N34 Turbine Lube Oil System			X			
77 1N11 Main & Reheat Steam System			X				89 1N41 - Generator/Generator Controls & Supervisory			X			
78 SN12 Aux. Steam System			X				90 1N42 Seal Oil System			X			
79 1N19 Condensate System	X						91 1N43 Generator Cooling System			X			
80 1N21 Feedwater System			X				92 1N44 Hydrogen & Carbon Dioxide Sys.			X			
81 1N22 Condensate Cleanup System			X				93 1N51 Exciter/Thyristor Voltage Regul.			X			
82 1N22 Condensate Precoat System	X						94 1N62 Condenser Air Removal System			X			
83 1N23 Heater Vents & Drains System			X				95 1N71 Circulating Water System			X			
84 1N32 Turbine Control Fluid System			X				96 SN72 Chlorination System	X					

GGNS SYSTEM/PHASE MATRIX

DESCRIPTION	1	2	3	4	5	6	DESCRIPTION	1	2	3	4	5	6
97 1P11 - Cond. & Refueling Storage & Tran. Sys.	X						109 1R24 22KV Isophase Bus Vent. Sys.			X			
98 SP21 Makeup Water Treatment Sys.				X			110 1R24 Isophase Bus Vent. Heat Load			X			
99 1P33 Process Sampling System	X						111 1R62 Cathodic Prot. System			X			
100 1P43 Turbine Bldg. Clg. Wtr. Sys.	X						112 1T41 Aux. Building Vent. System	X					
101 1P44 Plant Service Water System	X						113 1U41 Turbine Bldg. Vent. System			X			
102 1P45 Floor & Equip. Drain System	X						114 1Y36 Grounding System	X					
103 1P52 Service Air System	X						115 SZ17 Control Bldg. HVAC System	X					
104 1P53 Deleted							116 1W67 Circ Water Pumphouse Vent System	X					
105 1P60 Supp. Pool Cleanup System	X						117 T51 Emergency Pump Room Coolers	X					
106 SP66 Domestic Water System	X						118 1E31 Leak Detection System			X			
107 1P71 Plant Chilled Water System	X						119 1C61 Remote Shutdown Panel			X			
108 1R14 Main Transformer			X				120 1M61 CTMT Leak Rate System & Test			X			

JUSTIFICATION FOR DELAY OF SYSTEMS
PREOPERATIONAL TESTING
DURING PHASE 1 AND 2

1C51 POWER RANGE MONITORING

All system components will be installed, however, all electronics will not be functional to ensure a safe fuel loading operation. The requirements of the Technical Specifications will be met with respect to the required LCO's and action statements. Required to be operational for Phase 2.

1C91 NSSS PROCESS COMPUTER

There are no calculations required to be performed by the process computer with regard to core physics, fuel isotopic accounting of thermal hydraulic margins in Phase 1. Rod Control and Information System (RC&IS) is more than sufficient to denote control rod pattern conditions if they are deemed to be necessary.

1C34	FEEDWATER CONTROL
1D17	MAIN STEAM LINE RADIATION MONITORING
1D17	OFFGAS RADIATION MONITORING
1D17	TURBINE BUILDING
1D21	TURBINE BUILDING
1N64	OFFGAS SYSTEM
1N11	MAIN & REHEAT STEAM SYSTEM
1N21	FEEDWATER SYSTEM
1N22	CONDENSATE CLEANUP
1N23	HEATER VENTS & DRAINS SYSTEM
1N32	TURBINE CONTROL FLUID SYSTEM
1N33	MAIN AND RFPT TURBINE SEAL STEAM & DRAINS
1N34	LUBE OIL STORAGE AND CONDITIONING
1N34	TURBINE LUBE OIL SYSTEM
1N41	GENERATOR/EXCITER CONTROLS AND SUPERVISORY
1N42	SEAL OIL
1N43	GENERATOR COOLING SYSTEM
1N44	HYDROGEN & CARBON DIOXIDE SYSTEM
1N51	EXCITER/THYRISTOR VOLTAGE REGULATOR
1N62	CONDENSER AIR REMOVAL SYSTEM
1N71	CIRCULATING WATER SYSTEM
1R14	MAIN TRANSFORMER
1R24	22 KV ISOPHASE BUS VENTILATION SYSTEM
1R24	ISOPHASE BUS VENTILATION HEAT LOAD
1R62	CATHODIC PROTECTION SYSTEM

The above noted systems are secondary balance of plant systems and are not required to be operable nor are they required to support fuel load in the reactor vessel. Operability required at Phase 3.

1C51 TRAVERSING INCORE PROBE (TIP)

The Traversing Incore Probe System is not required to be operable as the reactor is subcritical or low power physics testing. As the function of the TIP System is for calibration of LPRM's used for power range monitoring, this system has no functional requirements until Phase 3.

1C87 LOOSE PARTS MONITOR SYSTEM

During the Phase 1 period of fuel load, the Recirculation System and Feedwater System are not in operation. Therefore, as there is no vessel flow, the Loose Parts Monitor System is not required.

In addition to the above, the Loose Parts Monitor System cannot be calibrated for operational conditions until the reactor is in Phase 3 and greater power levels to establish background levels.

1E30 SUPPRESSION POOL MAKEUP

Per Technical Specification, Section 3/4.10.1, "Primary Containment Integrity", integrity is not required during the fuel loading operation and low power. Also, all fuel movements for initial fuel load will be made dry, thus rendering this system unnecessary and inoperable.

As suppression pool level is included in the containment integrity definition and containment integrity is not required, the E30 system also is unnecessary until Phase 2.

1E32 MSIV LEAKAGE CONTROL SYSTEM

1E51 REACTOR CORE ISOLATION COOLING SYSTEM

As the reactor is subcritical, the vessel head removed and generating no heat during Phase 1 and 2, these systems are unnecessary until Phase 3.

1E61 COMBUSTIBLE GAS CONTROL SYSTEM & H₂ IGNITER SYSTEM

As the reactor will not have been operated at a power level high enough to produce hydrogen from radiolytic decomposition or a metal-water reaction, this system is not required until Phase 3.

SG17 CHEMICAL WASTE (LIQUID RADWASTE)

As no resin regenerations of contaminated demineralizers will be occurring prior to Phase 3, it is not necessary to place this portion of the radwaste systems into operation.

SG18 SOLID RADWASTE SYSTEM PROCESSING

Same as SG17.

1G41/G46 FUEL POOL COOLING & CLEANUP SYSTEM

As the fuel will be received and stored dry, this system is unnecessary prior to Phase 3.

1T48 STANDBY GAS TREATMENT

Prior to Phase 3, the reactor will not have operated at a power level high enough to cause any significant amounts of fuel irradiation; therefore, handling of irradiated fuel inside or outside the containment is not of concern. Secondary containment integrity and implicitly standby gas treatment is not required with an exception taken for the requirement of secondary containment with regard to core alterations prior to Phase 3.

1U41 TURBINE BUILDING VENTILATION SYSTEM

Since there is no nuclear steam generation prior to Phase 3, there will be no radioactive releases to the Turbine Building. This system is not required to be operational.

1E31 LEAK DETECTION SYSTEM

The primary function of leakage detection is to detect and isolate leaks, thus insuring containment integrity. Prior to Phase 3, primary containment is not required and no irradiated fuel exists in the vessel, thus this system is not required until Phase 3.

1C61 REMOTE SHUTDOWN PANEL

As the function of the Remote Shutdown Panel is to take the reactor from hot shutdown to cold shutdown, and as the reactor is already below 212°F prior to Phase 3 this system is not required.

SN12 AUXILIARY STEAM SYSTEM

This system is not required to be operational during Phase 1 and 2 as there are no steam loads required. There will be no chemical waste nor floor drain waste processed during these phases. Therefore, the evaporators will not be needed for operation.

1M61 CONTAINMENT LEAK RATE SYSTEM & TEST

As primary containment is not required until Phase 3, it is not necessary to have completed the leak rate test until prior to going into Phase 3.

JUSTIFICATION FOR DELAY OF SYSTEMS
PREOPERATIONAL TESTING DURING
PHASE 3

SN64 OFF GAS SYSTEM

Prior to Phase 3, no nuclear steam will be generated, thus treatment of off gases from the condenser are not required.

Until such time as the charcoal beds are not capable of maintaining off gas releases within acceptable limits at ambient temp, the off gas refrigeration units are not required until Phase 4.

SP21 MAKEUP WATER TREATMENT

This system is not required for the safety or operation of the Plant. If the system is not available, makeup water which meets all necessary criteria can be supplied by other means.