

**INTER-OFFICE MEMORANDUM**

SAVANNAH RIVER PLANT

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November 7, 1979

Mr. Faust Rosa, Chief
Power Systems Branch
Mail Stop P-832B
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Rosa:

GRAND GULF 1 & 2 FSAR REVIEW
INITIAL QUESTIONS

Attached are questions developed during initial review of Section 8.1 of Grand Gulf 1 & 2 Final Safety Analysis Report.

We are sending questions to you as they are developed, rather than sending all questions simultaneously at a later date. Early resolution of questions should benefit the utility and expedite our review.

Please transmit the attached questions to Mississippi Power and Light Company at your earliest convenience.

Please advise if additional information is required by your staff or the utility. We are prepared to provide additional details by telephone or in a meeting if needed.

Yours very truly,

W. M. Taylor
Superintendent
E & I Department

WMT:ssr

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- Q040. - In section 8.1.1 there is no mention of how or where
(8.1)
GG Grand Gulf Nuclear Station ties into the grid system.
1
Clarification can be made by making reference to the
Grand Gulf area block on Figure 8.2-2 and also refer-
encing Figure 8.2-3 in FSAR section 8.1.1.
- Q040. - Section 8.1.4.1.b says that there are three (3) physically
(8.1)
GG independent circuits from the 500KV switchyard to the
2
onsite electrical distribution system. Figure 8.2-3
indicates that there are only two (2) circuits from the
500KV switchyard and one (1) circuit from the 115KV system
which does not enter the 500KV switchyard. Please clarify.
- Q040. - In section 8.1.4.2.3.e it is stated that the fuel capacity
(8.1)
GG for the standby power source has "time sufficient to put
3
the plant in a safe condition". How much time is
"sufficient"?
- Q040. - In the first paragraph of section 8.1.4.3 a "spare set of
(8.1)
GG BOP transformers" are mentioned. Are these in addition
4
to those shown in Figure 8.1-1 or do you mean that these
are included in the four BOP transformers shown (such as
BOP XFMRs #12A and 12B)?
- Q040. - In section 8.1.4.2.3.f it is stated that "provision is
(8.1)
GG made for control (of the HPCS power system) from the
5
control room and another location external to the control
room". Where is the other location?

Q040. - Each section of Chapter 8 (i.e. 8.1, 8.2, 8.3.1, and
(8.0)
GG 8.3.2) should mention conformance (or exception) to all
6 of the laws, regulations, and guides as set forth on the
attached Table 8-1. This may be done by a single com-
prehensive table in section 8.1 which would be referenced
by the subsequent sections. Where exceptions, relative
to the electrical power systems, are taken, these should
be specifically noted and referenced to a detailed
explanation.

Q040. - In section 8.1.4.4.1 it is stated that the design is
(8.1)
GG in accordance with Regulatory Guide 1.93, among others.
7 However, in the table of contents of Appendix 3A,
RG 1.93 is noted as "not addressed in FSAR.....".
These conflict. Please clarify.

Q040. - In Appendix 3A, page 3A-4, Regulatory Guide 1.32 is
(Appx. 3A)
GG noted as N/A which we interpret as meaning "not
8 applicable". However, on page 3A/1.32-1, your project
position states that you comply with RG 1.32. These
conflict. Please clarify.

Q040. - Which of the 500KV and 115KV overhead lines are completed
(8.2)
GG and ready for service at this time? For those that are
9 not completed, list scheduled or projected date of
completion.

ACCEPTANCE CRITERIA FOR ELECTRIC POWER - TABLE 8-1

CRITERIA	TITLE	APPLICABILITY (SAR Section)				REMARKS
		8.1	8.2	8.3.1	8.3.2	
1. 10 CFR Part 50						
a. 10 CFR §50.34	Contents of Applications: Technical Information	X	X	X	X	
b. 10 CFR §50.36	Technical Specifications	X	X	X	X	
c. 10 CFR §50.55a	Codes and Standards	X	X	X	X	
2. General Design Criteria (GDC), Appendix A to 10 CFR Part 50						
a. GDC-1	Quality Standards and Records	X	X	X	X	
b. GDC-2	Design Bases for Protection Against Natural Phenomena	X	X	X	X	
c. GDC-3	Fire Protection	X	X	X	X	
d. GDC-4	Environmental and Missile Design Bases	X	X	X	X	
e. GDC-5	Sharing of Structures, Systems, and Components	X	X	X	X	
f. GDC-13	Instrumentation and Control	X	X	X	X	
g. GDC-17	Electric Power Systems	X	X	X	X	
h. GDC-13	Inspection and Testing of Electrical Power Systems	X	X	X	X	
i. GDC-21	Protection System Reliability and Testability	X	X	X	X	
j. GDC-22	Protection System Independence	X			X	

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TABLE 8-1 (CONTINUED)

CRITERIA	TITLE	APPLICABILITY (SAR Section)				REMARKS
		8.1	8.2	8.3.1	8.3.2	
k. GDC-33	Reactor Coolant Makeup	X	X	X	X	
l. GDC-34	Residual Heat Removal	X	X	X	X	
m. GDC-35	Emergency Core Cooling	X	X	X	X	
n. GDC-38	Containment Heat Removal	X	X	X	X	
o. GDC-41	Containment Atmosphere Cleanup	X	X	X	X	
p. GDC-44	Cooling Water	X	X	X	X	
3. Institute of Electrical and Electronics Engineers (IEEE) Standards:						
a. IEEE Std 279 (ANSI N42.7)	Criteria for Protection Systems for Nuclear Power Generating Stations	X		X	X	See 10 CFR 50.55a(h) and Reg. Guide 1.62
b. IEEE Std 308	Criteria for Class 1E Electric Systems for Nuclear Power Generating Stations	X	X	X	X	See Reg. Guide 1.32
c. IEEE Std 317	Electric Penetration Assemblies in Containment Structures for Nuclear Power Generating Stations	X		X	X	See Reg. Guide 1.63
d. IEEE Std 323	Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations	X		X	X	See Reg. Guide 1.89
e. IEEE Std 334	Standard for Type Test of Continuous Duty Class 1E Motors for Nuclear Power Generating Stations	X		X		See Reg. Guide 1.40
f. IEEE Std 336 (ANSI N45.2.4)	Installation, Inspection and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations	X	X	X	X	See Reg. Guide 1.30
g. IEEE Std 338	Criteria for the Periodic Testing of Nuclear Power Generating Station Protection Systems	X	X	X	X	See Reg. Guide 1.118

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TABLE 8-1 (CONTINUED)

CRITERIA	TITLE	APPLICABILITY (SAR Section)				REMARKS
		8.1	8.2	8.3.1	8.3.2	
h. IEEE Std 344 (ANSI N41.7)	Guide for Seismic Qualification of Class I Electrical Equipment for Nuclear Power Generating Stations	X		X	X	See Reg. Guide 1.100
i. IEEE Std 379 (ANSI N41.2)	Guide for the Application of the Single Failure Criterion to Nuclear Power Generating Station Protection Systems	X		X	X	See Reg. Guide 1.53
j. IEEE Std 382	Trial-Use Guide for the Type-Test of Class I Electric Valve Operators for Nuclear Power Generating Stations (ANSI N41.6)	X		X		See Reg. Guide 1.73
k. IEEE Std 383	Standard for Type Test of Class 1E Electric Cable Field Splices, and Connections for Nuclear Power Generating Stations	X		X	X	
l. IEEE Std 384 (ANSI N41.14)	Criteria for Separation of Class 1E Equipment and Circuits	X		X	X	See Reg. Guide 1.75
m. IEEE Std 387 (ANSI N41.13)	Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Stations	X		X		
n. IEEE Std 415	Planning of Pre-Operational Testing Programs for Class 1E Power Systems for Nuclear Power Generating Stations, IEEE Guide for	X		X	X	
o. IEEE Std 420	Trial-Use Guide for Class 1E Control Switchboards for Nuclear Power Generating Stations (ANSI N41.7)	X		X	X	
p. IEEE Std 450	Recommended Practice for Maintenance, Testing and Replacement of Large Stationary Type Power Plant and Substation Lead Storage Batteries	X			X	See Reg. Guide 1.129
q. IEEE Std 484	Recommended Practice for Installation Design and Installation of Large Lead Storage Batteries for Nuclear Power Plants	X			X	See Reg. Guide 1.128

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TABLE 8-1 (CONTINUED)

CRITERIA	TITLE	APPLICABILITY (SAR Section)				REMARKS
		8.1	8.2	8.3.1	8.3.2	
4. Regulatory Guides (RG)						
a. RG 1.6	Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems	X		X	X	
b. RG 1.9	Selection of Diesel Generator Set Capacity for Standby Power Supplies	X		X		
c. RG 1.29	Seismic Design Classification	X		X	X	
d. RG 1.30	Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment	X	X	X	X	
e. RG 1.32	Use of IEEE Std 308, "Criteria for Class 1E Electric Systems for Nuclear Power Generating Stations"	X	X	X	X	
f. RG 1.40	Qualification Tests for Continuous-Duty Motors Installed Inside the Containment of Water Cooled Nuclear Power Plants	X		X		
g. RG 1.41	Preoperational Testing of Redundant Onsite Electric Power Systems to Verify Proper Load Group Assignments	X	X	X	X	
h. RG 1.47	Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems	X	X	X	X	
i. RG 1.53	Application of the Single-Failure Criterion to Nuclear Power Plant Protection Systems	X		X	X	
j. RG 1.63	Electric Penetration Assemblies in Containment Structures for Water-Cooled Nuclear Power Plants	X		X	X	
k. RG 1.68	Preoperational and Initial Startup Test Programs for Water-Cooled Power Reactors	X	X	X	X	

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TABLE S-1 (CONTINUED)

CRITERIA	TITLE	APPLICABILITY (SAR Section)				REMARKS
		8.1	8.2	8.3.1	8.3.2	
l. RG 1.70	Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants	X	X	X	X	
m. RG 1.73	Qualification Tests of Electric Valve Operators Installed Inside the Containment of Nuclear Power Plants	X		X		
n. RG 1.75	Physical Independence of Electric Systems	X		X	X	
o. RG 1.81	Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants	X		X	X	
p. RG 1.89	Qualification of Class 1E Equipment for Nuclear Power Plants	X		X	X	
q. RG 1.93	Availability of Electric Power Sources	X	X	X	X	
r. RG 1.100	Seismic Qualification of Electric Equipment for Nuclear Power Plants	X		X	X	
s. RG 1.106	Thermal Overload Protection for Electric Motors on Motor-Operated Valves	X		X		
t. RG 1.108	Periodic Testing of Diesel Generators Used As Onsite Power Systems at Nuclear Power Plants	X		X		
u. RG 1.118	Periodic Testing of Electric Power and Protection Systems		X	X	X	
v. RG 1.120	Fire Protection Guidelines for Nuclear Power Plants	X	X	X	X	
w. RG 1.128	Installation Design and Installation of Large Lead Storage Batteries for Nuclear Power Plants	X			X	
x. RG 1.129	Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants	X			X	



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TABLE 8-1 (CONTINUED)

CRITERIA	TITLE	APPLICABILITY (SAR Section)				REMARKS
		8.1	8.2	8.3.1	8.3.2	
5. Branch Technical Positions (BTP) ICSB						
a. BTP ICSB 2 (PSB)	Diesel-Generator Reliability Qualification Testing	X		X		
b. BTP ICSB 6 (PSB)	Capacity Test Requirements of Station Batteries-Technical Specifications	X			X	
c. BTP ICSB 8 (PSB)	Use of Diesel-Generator Sets for Peaking	X		X		
d. BTP ICSB 11 (PSB)	Stability of Offsite Power Systems	X	X			
e. BTP ICSB 15 (PSB)	Reactor Coolant Pump Breaker Qualification		X			
f. BTP ICSB 17 (PSB)	Diesel Generator Protective Trip Circuit Bypasses	X		X		
g. BTP ICSB 18 (PSB)	Application of the Single Failure Criterion to Manually-Controlled Electrically-Operated Valves			X		
h. BTP ICSB 21	Guidance for Application of RG 1.47	X	X	X	X	

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Q040. - For the outage statistics given in Table 8.2-1, please
(8.2)
GG furnish the following information;
10
a) cause of each outage
b) duration of each outage
c) data on outages occurring between 1977 and the present
time

Q040. - In section 8.2.1.2 and section 8.2.1.4 the acronym
(8.2)
GG "NAPSIC" is used. Please explain the meaning and the
11 function of NAPSIC.

Q040. - Explain how you comply with Regulatory Guide 1.9
(8.3)
GG paragraph C.9 with respect to alarm sequence indication.
12

Q040. - Explain the differences between the interlocks for the
(8.3)
GG HPCS diesel and diesel's 11 & 12 (21 & 22) for overspeed,
13 generator differential current, lube oil pressure low
and crankcase pressure high. Also provide the logic
diagram for ESF Division III diesel control logic.

Q040. - In 8.3.1.1.5.1 and Figure 8.3-11, we only see two
(8.3)
GG separate buses. The FSAR indicates four redundant buses.
14 Please clarify.

- Q040. - In section 8.2.1.2 it is stated that "a fault of any
(8.2)
GG section of 500KV bus will be cleared.....and not
15 interrupt operation of any of the remaining parts of the
500KV switchyard bus". Please provide further information describing how this selectivity of breakers is accomplished.
- Q040. - In section 8.2.1.2, page 8.2-4, the layout of the sub-
(8.2)
GG station is referred to as Figure 8.2-4. This should be
16 corrected to read; Figure 8.2-3.
- Q040. - In Table 8.2-3 "Load Flow Studies" and Table 8.2-4
(8.2)
GG "Stability Studies" there are no quantitative values to
17 indicate that these studies were truly satisfactory.
Please supply minimum or maximum voltage, transient durations, and other quantitative values to substantiate the conclusions drawn in the tables.
- Q040. - In section 8.2.1.2, it is not clear whether or not there
(8.2)
GG are alarms for the various problems that could occur
18 involving the switchyard auxiliary systems. Please clarify this stating the alarm indication location.

Q040. - In section 8.2.1.1 page 8.2-3 it is stated that "there
(8.2)
GG has only been an average loss of two towers per year...".
19

Provide further detail of these tower failures and show how this compares to the experience of other utilities.

Q040. - In section 8.2.1.1 on page 8.2-2, it is stated that "The
(8.2)
GG 115KV line does not cross over or under any of the 500KV
20

offsite power supply lines...". However, from Figure 8.2-2, it appears that the 500KV line from Franklin to Grand Gulf does cross over the 115KV line between Nalco S.E.S. and Port Gibson. Please supply further information about Port Gibson substation to indicate what would happen at Grand Gulf if the above mentioned 500KV line fell on top of that 115KV line.

Q040. - In section 8.2.1.3 it is stated that "routine maintenance
(8.2)
GG on power circuit breakers will be performed as required...".
21

Please make a more definite statement as to the actual schedule for inspection and testing of these breakers.