



GULF STATES UTILITIES COMPANY

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December 3, 1984
RBG-19612
File No. G9.5, G9.8.6.2

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

River Bend Station - Unit 1
Docket No. 50-458

The design of automatically initiated engineered safety feature (ESF) systems at River Bend Station is such that the system or a portion of the system may be placed in an inoperable status or bypassed during the performance of periodic tests or maintenance. To alert the operator(s) of the inoperable or bypassed status of these and other manually actuated safety systems, administrative procedures are supplemented with automatic indication of system inoperability. The automatic indication consists of annunciator points (visual and audible indication) in the main control room (MCR) to alert the operator to an inoperable condition. This indication is provided at the system level for each division or train by indication on an annunciator panel. Beneath this system "inoperable indication" more specific indication provides the basis for the inoperable status. This indication consists of component or subsystem inoperable/bypass status indication on the vertical portion of the bench boards. This design has been implemented to meet the intent of Regulatory Guide 1.47 which is to provide automatic indication of inoperable status of automatically initiated ESF systems.

Section 4.13 of IEEE Standard 279-1971 upon which Regulatory Guide 1.47 is based states:

"If the protective action of some part of the system has been bypassed or deliberately rendered inoperative for any purpose, this fact shall be continuously indicated in the control room."

River Bend Station design meets this criteria from IEEE-279.

Position C.2 of Regulatory Guide 1.47 provides guidance for control room design that expands on this criteria to include automatic indication at the system level of the bypassing or deliberately induced inoperability of any auxiliary or supporting system that effectively bypasses or renders inoperable the protection system and the systems actuated or

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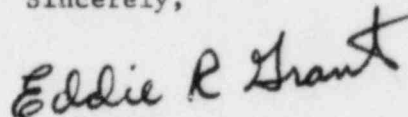
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controlled by the protection system. This guidance was issued in May 1973 at a time when experience at operating plants indicated that, when the measures used to indicate operable status consist solely of administrative procedures, the operator was not always fully aware of the ramifications of each bypassed or inoperable component. The guidance indicated that an acceptable way of aiding the operator's knowledge of plant status is to supplement administrative procedures with automatic indication of the bypass or inoperability of each redundant portion of a system that performs an engineered safety function.

Gulf States Utilities agrees with the intent of the regulatory guidance and has provided inoperable status indication that does not consist solely of administrative procedures. River Bend Station supplements its administrative procedures with automatic indication of the bypass or inoperability of the subject systems at the system level. Thus, Gulf States Utilities has provided inoperable status indication in the main control room when the protective action of an automatic system required for safety has been bypassed or deliberately rendered inoperative in accordance with Section 4.13 (Indication of Bypasses) of IEEE 279-1971.

Further, Gulf States Utilities agrees with the Staff's assertion that the loss of redundancy of automatically initiated engineered safety features should be indicated to the operator. In order to provide this indication and close Item (9) of Table 1.3 of the Safety Evaluation Report, Gulf States Utilities will provide the necessary and sufficient indication of the bypass or inoperability of auxiliary/support systems for each redundant portion (division) of a system. This support system indication will be provided as identified in the attached Final Safety Analysis Report revisions no later than the first refueling outage following approval of these proposed changes in a future supplement to the SER. These revisions will be reflected in a future FSAR amendment.

Sincerely,



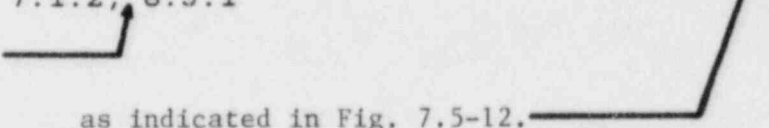
for J. E. Booker
Manager-Engineering
Nuclear Fuels & Licensing
River Bend Nuclear Group

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TABLE 1.8-1 (Cont)

Regulatory Guide 1.47 (May 1973)Bypassed and Inoperable Status Indication
for Nuclear Power Plant Safety SystemsProject Position - Comply with the following clarifications: | 11

1. An indicator of bypass/inoperability, located in the main control room, is provided for redundant or diverse portions of each automatically actuated safety system. Bypass indication is provided for operator actions that render the system inoperable. | 11
2. Bypass of redundant portions of automatically actuated engineered safety feature support systems warrants indicators that must be differentiated from safety system bypass indicators. To reflect the impact on the safety system, bypass of the support system also actuates the safety system bypass indicators. | 11

FSAR Sections - 7.1.2, 8.3.1 | 117.5.1.5, 

as indicated in Fig. 7.5-12.

RBS FSAR

QUESTION 421.007 (7.1.2.4)(7.5)

In the discussion on conformance to Regulatory Guide (RG) 1.47, FSAR, Section 7.1.2.4, the statement is made that system level annunciation upon actuation of bypass or test switches is not fully implemented into the design. Identify all safety-related systems in which this feature is not implemented in the design and discuss plans to bring these systems into conformance with RG 1.47. In addition, determine whether the bypass and inoperable status indication system complies with position B2 of ICSB Branch Technical Position 21, discuss the design philosophy used in the selection of equipment/systems to be monitored, and provide a complete list of system automatic and manual bypasses within the BOP and NSSS scope of supply as it pertains to the recommendations of R.G. 1.47.

The design philosophy should describe as a minimum the criteria to be employed in the display of inter-relationships and dependencies on equipment/systems and should verify that the bypassing or deliberately induced inoperability of any auxiliary or support system will automatically indicate all safety systems affected.

RESPONSE

The response to this request is provided in revised Section 7.1.2.4, Item 4., revised Section 7.5.1.5 and new Table 7.5-12.

Branch Technical Position ICSB 21, Position B2, relates to shared systems. This is addressed in the response to Question 421.027.

4. Conformance to Regulatory Guide 1.47

- 11 | The system of bypass/inoperative indication for automatic safety systems is designed to satisfy the requirements of IEEE 279-1971, paragraph 4.13 and Regulatory Guide 1.47.
- 11 | The design of the bypass/inoperative indication system allows testing during normal operation, and is used to supplement administrative procedures by providing indication of automatic safety system status.
- 11 | The bypass/inoperative indication system is designed and installed in a manner which precludes the possibility of adverse effects on the plant safety systems. Those portions of the system which when faulted could reduce the independence between redundant safety systems are electrically isolated from the protection circuits.

Typically, the following bypasses or inoperabilities cause automatic actuation of system level annunciation for the affected system:

1. Pump motor breaker not in operate position
2. Loss of pump motor control power
3. Loss of motor-operated valve control power/motive power
4. Logic power failure
5. Logic in test
- 11 | 6. Bypass or test switches actuated.

11 | Automatic indication and annunciation are provided in the main control room to indicate that a system or part of a system is inoperable or bypassed. Bypass/inoperative indication is provided for those automatic safety systems indicated in Table 7.1-3 under Regulatory Guide 1.47. In addition, bypass/inoperative indication is provided for the following manually actuated systems:

1. Combustible gas control system
2. Standby liquid control system
3. Penetration valve leakage control system.

Details of the system inputs are provided in the logic diagrams provided in Sections 7.3, 7.4, 7.5, and 7.6 and in

the discussion on diesel generator system protection and surveillance in Section 8.3.1.1.4.

Bypasses of certain infrequently used pieces of equipment, such as manual locked-open valves, are not automatically annunciated in the main control room. However, capability for manual activation of each system level bypass/inoperative status indicator is provided by means of handswitches in the main control room for those systems that have these infrequently used bypasses.

Operation of manual valves, use of manual disconnects, or other operations occurring once a year or less frequently which could impair plant safety system performance, are controlled by administrative procedures and followed by system testing when such infrequent operations are completed. RBS administrative procedures contain shift turnover instructions which provide for a positive assessment of plant conditions and system status. These procedures minimize the probability of system bypasses existing undisclosed between periodic functional tests.

11

A summary of bypass and inoperable indication is provided in Fig. 7.1-4 with reference to FSAR logic diagrams. Cascading logic indication is not provided when support systems are normally in continuous operation or are manually actuated in accordance with operating in emergency procedures. In these cases, the operator has adequate indication of proper support system operation and separate bypass and inoperable indication is not required.

for auxiliary and support systems is provided in Section 7.5.1.5 and shown in Fig. 7.5-12.

RBS FSAR

TABLE 7.1-4

THIS TABLE HAS BEEN DELETED.

(3 PAGES)

1. Isolation valve position lights indicate valve closure.
2. Main steam flow indication.
3. Annunciators and indicators for the containment and reactor vessel isolation system variables and trip logic in the tripped state.
4. Process computer logs trips.

7.5.1.4 ECCS and RCIC Indication

The following information is provided to the main control room operator to monitor ECCS and RCIC system status.

1. Indicators for HPCS, LPCS, RHR, ADS, and RCIC variables and trip logic in the trip state.
2. Flow and/or pressure indications for each ECCS and RCIC are provided.
3. ECCS and RCIC valve position indication.
4. Process computer logging of trips in the ECCS and RCIC.
5. SRV position indication including those in ADS. The power source is instrument AC.
6. SRV discharge pipe temperature monitors.

INSERT

7.5.1.6 Other System Indications

Position lights are provided for containment isolation valves or dampers associated with systems other than those mentioned above. (See Table 7.5-1).

7.5.2 Analysis

The safety-related display instrumentation provides adequate information to allow the operator to perform the necessary manual safety functions during normal operation, transients, and accident conditions. The SRDI that is part of a safety-related system and used for safety-related operator information or the redundant reactor pressure and water level instrumentation are in compliance with the requirements applicable to safety-related systems.

7.5.1.5 Bypass and Inoperable Status Indication

The design of automatically initiated engineered safety feature (ESF) systems at River Bend Station is such that the system or a portion of the system may be placed in an inoperable status or bypassed during the performance of periodic tests or maintenance. To alert the operator(s) of the inoperable or bypassed status of these and other manually actuated safety systems, administrative procedures are supplemented with automatic indication of system inoperability. The automatic indication consists of annunciator points (visual and audible indication) in the main control room (MCR) to alert the operator to an inoperable condition. This indication is provided at the system level for each division or train by indication on an annunciator panel. Beneath this system "inoperable indication" more specific indication provides the basis for the inoperable status. This indication consists of component or subsystem inoperable/bypass status indication on the vertical portion of the bench boards. This design has been implemented to meet the intent of Regulatory Guide 1.47 which is to provide automatic indication of inoperable status of automatically initiated ESF systems.

Position C.2 of Regulatory Guide 1.47 provides guidance for control room design that expands on this criteria to include automatic indication at the system level of the bypassing or deliberately induced inoperability of any auxiliary or supporting system that effectively bypasses or renders inoperable the protection system and the systems actuated or controlled by the protection system. Auxiliary or support systems necessary to assure operability of automatically initiated ESF systems are indicated in Figure 7.5-12. This figure also identifies those auxiliary/support systems which are cascaded into the bypass/inoperable indication of the ESF systems.

TABLE 7.5-12

Indication of Bypass/Inoperability
Due to Auxiliary/Support Systems

Automatic ESF System																									
Auxiliary Support Systems					EGF							HVC		HVP		HVR									
	HPCS	LPCS	RHR	RCIC	III	I & II	EGS	E22	EJS	ENS	GTS	III	I & II	III	I & II	III	I & II	HVY	LSV	SFC	SWP	ADS	HVF	HVK	
SWP	B	B	B	B	-	-	C	C	-	-	-	-	B	-	-	C	C	-	C	C	-	-	-	C	
EGA	-	-	-	-	-	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
EGF	-	-	-	-	-	-	B	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
EGS	-	D	D	D	-	D	-	-	D	D	D	-	D	-	D	-	D	D	D	D	D	D	D	D	
E22	D	-	-	-	D	-	-	-	-	-	-	D	-	D	-	D	-	-	-	-	-	-	-	-	
HVC	-	-	-	-	-	-	-	-	E	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HVF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	
HVK	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	
HVP	-	-	-	-	E	E	B	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HVR	C	C	C	C	-	-	-	-	E	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	
HVY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	

Legend:

ADS - Automatic Depressurization
E22 - HPCS Diesel Generator (Div. III)
EGA - DG Air Start
EGF - DG Fuel Oil Transfer
EGS - Standby Diesel Generator (Div. I & II)
EJS - 480V ac Electrical Distribution
ENS - 4160V ac Electrical Distribution
GTS - Standby Gas Treatment

HPCS - High Pressure Core Spray
HVC - Control Building Air/Conditioning
HVF - Fuel Building Ventilation
HVK - Control Building Chilled Water
HVP - DG Building Ventilation
HVR - Reactor Building Ventilation
HVY - Yard Structures Ventilation
LPCS - Low Pressure Core Spray

LSV - Penetration Valve Leakage
Control (Compressor)
RCIC - Reactor Core Isolation Cooling
RHR - Residual Heat Removal
SFC - Spent Fuel Cooling
SWP - Service Water (Standby)

Notes:

- A - Yes, bypass/inoperability of auxiliary/support systems is automatically indicated.
B - Yes, bypass/inoperability of auxiliary/support systems is automatically indicated, but future modifications will increase capabilities.
C - Yes, bypass/inoperability of auxiliary/support systems will be automatically indicated following future modifications.
*** The future modifications discussed in Notes B & C will be complete prior to startup following the first refueling outage.***
D - When the diesel generator (EGS or E22) is inoperative, all systems in that division are inoperative. Operator awareness is provided through training.
E - Inoperability of HVAC systems does not automatically render the supported system inoperable. Potential inoperability of the ESF systems is automatically indicated to the operator.