ATTACHMENT 2
PROPOSED TECHNICAL
SPECIFICATION CHANGE
4.5.6.2.b and BASES 3/4.5.6

3/4.5.6 RESIDUAL HEAT REMOVAL (RHR) SYSTEM

LIMITING CONDITION FOR OPERATION

3.5.6 Three independent Residual Heat Removal (RHR) loops shall be OPERABLE with each loop comprised of:

a. One OPERABLE RHR pump,

b. One OPERABLE RHR heat exchanger, and

c. One OPERABLE flowpath capable of taking suction from its associated RCS hot leg and discharging to its associated RCS cold leg.*

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one RHR loop inoperable, restore the required loop to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With two RHR loops inoperable, restore at least two RHR loops to OPERABLE status within 24 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With three RHR loops inoperable, immediately initiate corrective action to restore at least one RHR loop to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.5.6.1 Each RHR loop shall be demonstrated OPERABLE pursuant to the requirements of Specification 4.0.5.

4.5.6.2 At least once per 18 months by verifying automatic ~~isolation and~~ interlock action of the RHR system from the Reactor Coolant System to ensure that:

a. With a simulated or actual Reactor Coolant System pressure signal greater than or equal to 350 psig, the interlocks prevent the valves from being opened, and

~~b. With a simulated or actual Reactor Coolant System pressure signal less than or equal to 700 psig, the interlocks will cause the valves to automatically close.~~

*Valves MOV-0060 A, B, and C and MOV-0061 A, B, and C may have power removed to support the FHAR (Fire Hazard Analysis Report) assumptions.

BASES

3/4.5.6 RESIDUAL HEAT REMOVAL (RHR) SYSTEM

The OPERABILITY of the RHR system ensures adequate heat removal capabilities for Long-Term Core Cooling in the event of a small-break loss-of-coolant accident (LOCA), an isolatable LOCA, or a secondary break in MODES 1, 2, and 3. The limits on the OPERABILITY of the RHR system ensure that at least one RHR loop is available for cooling including single active failure criteria.

~~The surveillances ensure that RHR system isolation valves close upon an overpressure protection system signal.~~

ATTACHMENT 3
MARK-UP OF THE FINAL SAFETY ANALYSIS REPORT

TABLE 1.3-2 (Continued)

SIGNIFICANT DESIGN CHANGES

Item	References UFSAR	Description of Change
Qualified Display Processing System (QDPS)	Section 7.5	Addition of safety-related display processing system which provides redundant data acquisition and display. System provides Class 1E control of the SG power-operated relief valves, head vent throttle valves, AFW flow regulating valves, and ECW throttle valve for the essential chillers. The system also performs SG reference leg temperature compensation and RCS hot leg temperature averaging calculations.
Emergency Response Facilities Data Acquisition and Display	Section 7.5	Provides signal processing and display for Emergency Response Facilities and addresses SPDS requirement of NUREG 0696.
Letdown Stop Valves Pressurizer Level Interlocks	Section 7.6	Changes to letdown isolation signals. The pressurizer low level interlock closes the valves and prevents the operator from reopening them from the main control room until the pressurizer water level is above the setpoint. The closure signals to each letdown stop valve are delayed so that downstream valves can close before the stop valves, to prevent flashing in the regenerative heat exchanger.
Reactor Coolant Purity Control	Sections 7.6, 9.3.4	Addition of equipment to meet more stringent reactor makeup water chemistry parameters. Addition of safety grade isolation valves.
TMI Action Plan Requirements	Appendix 7A	NUREG 0737 modifications including post-accident sampling system, post-accident monitoring upgrades, upgrades to emergency response capabilities, etc.
Instrumentation and Control Power Supply System (Class 1E)	Sections 7.6, 8.3	Expansion of system for channels I and IV.
Residual Heat Removal Isolation Valve Logic	Sections 7.6, 5.4	Addition of logics for automatic closure of valves when above setpoint pressures.
Containment Hydrogen Monitoring System	Section 7.6	Key lock switches for the sampling and Containment isolation valves are deleted. Sampling points and monitor ranges changed.
Interlocks for RCS Pressure Control during Low Temperature Operation	Section 7.6	Addition of safety-grade logic for cold overpressure mitigation, using safety-grade transmitters, logic, and pressurizer PORVs.
Spray Additive Tank Low-Low Level Interlock	Section 7.6	Addition of safety-grade logic to close the spray additive tank isolation valve when the tank fluid reaches the low-low level setpoint.
Control Interlock C-17	Section 7.7	Addition of logic generating C-17 interlock and its use to stop turbine loading.

TABLE 5.4.A-2 (Continued)

COLD SHUTDOWN

FAILURE MODES AND EFFECTS ANALYSIS

Description Of Component	Safety Function	Plant Operating Mode*	Failure Mode(s)	Method Of Failure Detection	Failure Effect On System Safety Function Capability	General Remarks
Residual Heat Removal System						
RHR Pump 1A (pumps 1B and 1C analogous)	Operate and provide coolant flow for RHR operation	4-5	Fails to operate	Pump flow and discharge pressure indication and indicator lights at MCB	None - Two redundant RHR pumps available	(See Figure 5.4-6) Loss of pump may result in longer cooldown time
Motor-operated gate valves MOV-0060A and MOV-0061A (valves MOV-0060B and MOV-0061B, MOV-0060C and MOV-0061C analogous) (normally closed)	Open to allow RHR flow	4-5	Either valve fails to open on demand or once open, fails closed (e.g., false auto-closure signal)	Valve position indication, pump flow indication and alarm and discharge pressure indication at MCB	None - Redundant RHR trains provide cooling	
	Close to isolate the RHR system from the RCS	4-5	Fails to close	Valve position indication, pressure and temperature indications at MCB	None - Redundant valves in series provide isolation	

* Plant Modes

1. Power Operation
2. Startup
3. Hot Standby
4. Hot Shutdown
5. Cold Shutdown
6. Refueling

7.6.2 Residual Heat Removal Isolation Valves

7.6.2.1 Description. There are two motor-operated gate valves in series in each inlet line from the Reactor Coolant System (RCS) to the Residual Heat Removal System (RHRS), as shown on Figure 5.4-6. They are normally closed and are manually opened from the control room for residual heat removal (RHR) after RCS pressure and temperature are reduced to approximately 400 psig and 350°F, respectively. As shown on Figure 5.4-6 and on the control logic (Figure 7.6-2), the two valves in each RHR inlet line are powered from different Class 1E power sources. Additionally, power is locked at the motor control center (MCC) breaker for the valve closest to the RHR pump to mitigate the consequences of spurious opening of the valves during plant operation.

These valves are controlled by three RCS wide-range pressure transmitters, shown on Figure 5.1-1. The transmitters, PT-405, PT-406, and PT-407, are located outside the Containment. Conformance of the design to Containment isolation requirements is discussed in Section 6.2.4. Two additional RCS wide-range pressure transmitters, PT-403 and PT-404, are also shown on Figure 5.1-1. These transmitters are used for RCS cold overpressure mitigation (via the pressurizer power-operated relief valves (PORVs)). These two transmitters are located inside the Containment. Table 7.6-1 shows the manufacturer, model number, protection set assignment, and RCS loop monitored for each transmitter.

The signal from each transmitter controlling the RHR inlet isolation valves provides two functions: a permissive that allows valve opening below a preset pressure and an automatic closure on pressures above a preset value. The open permissive ensures that the valve is not opened when the RCS pressure plus the RHR pump discharge pressure is above the RHRS design pressure. The two valves in each RHR train receive pressure signals from different pressure transmitters, through the Engineered Safety Features (ESF) actuation train corresponding to the train of power supplied to the valve.

7.6.2.2 Analysis. The applicable requirements of IEEE 308-1974 are applied to the electrical power supply for the RHRS pump motors and to the I&C for the motor-operated RHR inlet isolation valves. Based on the scope definitions presented in IEEE 279-1971 and 338-1971, these criteria do not apply to the RHR isolation valve interlocks; however, in order to meet Nuclear Regulatory Commission (NRC) requirements and because of the possible severity of the consequences of loss of function, the requirements of IEEE 279-1971 are applied with the following comments:

1. For the purpose of applying IEEE 279-1971 to this circuit, the following definitions are used.

   a. Protection System

      The two valves in series in each line and the components of their interlocking and closure circuits.

b. Protective Action

1) Against Normal RCS Pressures

Against normal RCS pressures, the protective action is the automatic initiation and maintenance of RHRS isolation from the RCS when RCS pressures are above a preset pressure.

2) To Assure Operability of One RHRS Train

For assured plant cooldown, the protective action is the removal of the ~~automatic~~ RHRS ~~isolation~~ when RCS pressure is below a preset pressure.

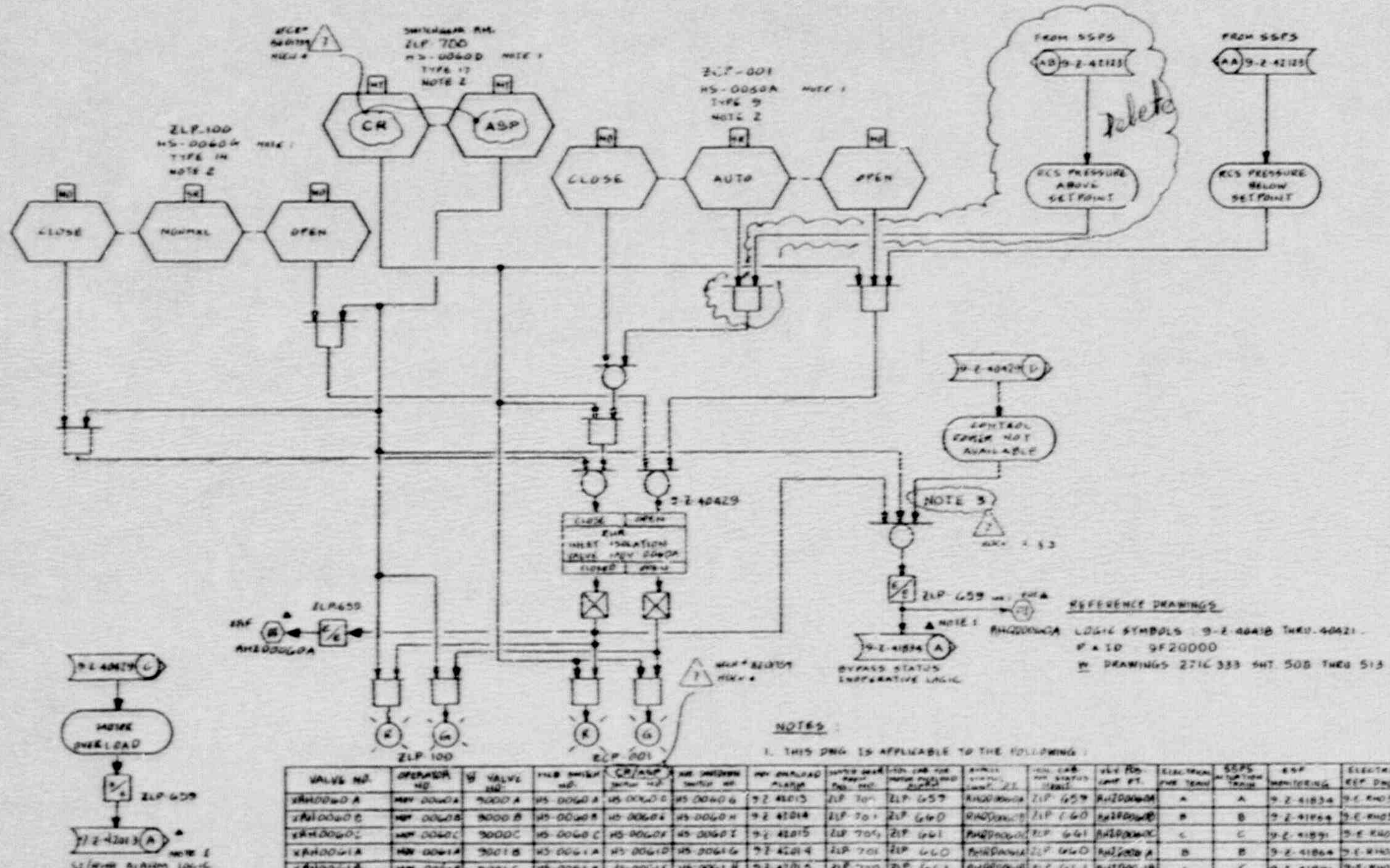
2. IEEE 279-1971, Paragraph 4.10: The above mentioned pressure interlock signals and logic are tested on-line to the maximum extent possible without adversely affecting safety. This test includes the analog signal through to the actuation train signal which activates the slave relay (the slave relay provides the final output signal to the valve control circuit). This test verifies both the protective action against normal RCS pressures and assures operability of one RHRS train. This is done in the best interest of safety since opening the valve could potentially leave only one remaining valve to isolate the low-pressure RHRS from the RCS.

Since the two valves in each RHR train are powered by separate power trains and actuated by separate actuation trains, no single failure can compromise the required RHR functions. Isolation against normal RCS pressures (above preset pressure) is assured by redundant valves, diversely actuated and powered ~~and by the power~~ lockout on one valve in each train. Operability for assured plant cooldown is assured because a failure in any one actuation or power train isolates only two trains, leaving the third train still operable. Branch Technical Position (BTP) ICSB 3 is followed for this interlock system. The interlock system meets the appropriate qualification standards, as discussed in Sections 3.10 and 3.11.

7.6.3 Accumulator Motor-Operated Valves

In considering that the requirements of IEEE 279-1971 apply to protective actions at both the channel level and system level, it is noted that for the accumulator isolation valves, the basis for control and proper functions is administrative control and passivity; the scope of IEEE 279-1971 covering protective action at the system level does not apply, although there is a requirement for protective action at the channel level. The interlock control features of the accumulator isolation valves at the channel level function in a confirmatory manner, and the requirements of IEEE 279-1971 are applied with the following comments:

1. When the pressurizer pressure is above or below the P-11 setpoint (approximately 1,900 psi), there are redundant interlock signals generated that are derived by sensors processed through circuitry designed to IEEE 279-1971 requirements in the analog process control racks and distributed as binary input (voltage/no voltage) signals to the Solid-State Protection System (SSPS) cabinets. Here they become logic signals that produce contact-available outputs from the safeguards



REFERENCE DRAWINGS

LOGIC SYMBOLS : 9-Z-40418 THRU 40421.

P & ID : 9F20000

W DRAWINGS 2716 333 SHT. 508 THRU 513

NOTES :

1. THIS DWG IS APPLICABLE TO THE FOLLOWING :

VALVE NO.	OPERATOR NO.	W VALVE NO.	[illegible] SWITCH NO.	CR/ASP SWITCH NO.	[illegible] SWITCH NO.	MTR OVERLOAD ALARM	[illegible]	[illegible]	[illegible]	[illegible] STATUS	VLV POS. [illegible]	ELECTRICAL [illegible] TRAIN	SSPS ACTUATION TRAIN	ESF MONITORING	ELECTRICAL REF. DWG
XRH0060A	MOV-0060A	9000A	HS-0060A	HS-0060D	HS-0060G	9-Z-42013	ZLP-700	ZLP-659	RH0060A	ZLP-659	RH0060A	A	A	9-Z-41834	9-E-RH03-01
XRH0060B	MOV-0060B	9000B	HS-0060B	HS-0060E	HS-0060H	9-Z-42014	ZLP-701	ZLP-660	RH0060B	ZLP-660	RH0060B	B	B	9-Z-41864	9-E-RH03-01
XRH0060C	MOV-0060C	9000C	HS-0060C	HS-0060F	HS-0060I	9-Z-42015	ZLP-705	ZLP-661	RH0060C	ZLP-661	RH0060C	C	C	9-Z-41891	9-E-RH03-01
XRH0061A	MOV-0061A	9001B	HS-0061A	HS-0061D	HS-0061G	9-Z-42014	ZLP-701	ZLP-660	RH0061A	ZLP-660	RH0061A	B	B	9-Z-41864	9-E-RH02-01
XRH0061B	MOV-0061B	9001C	HS-0061B	HS-0061E	HS-0061H	9-Z-42015	ZLP-705	ZLP-661	RH0061B	ZLP-661	RH0061B	C	C	9-Z-41891	9-E-RH02-01
XRH0061C	MOV-0061C	9001A	HS-0061C	HS-0061F	HS-0061I	9-Z-42013	ZLP-700	ZLP-659	RH0061C	ZLP-659	RH0061C	A	A	9-Z-41834	9-E-RH02-01

2. FOR SWITCH TYPES SEE DWG 9-Z-40421.

3. THIS INPUT IS APPLICABLE ONLY TO MOV'S 0060A, 0060B & 0060C.

GENERAL NOTE

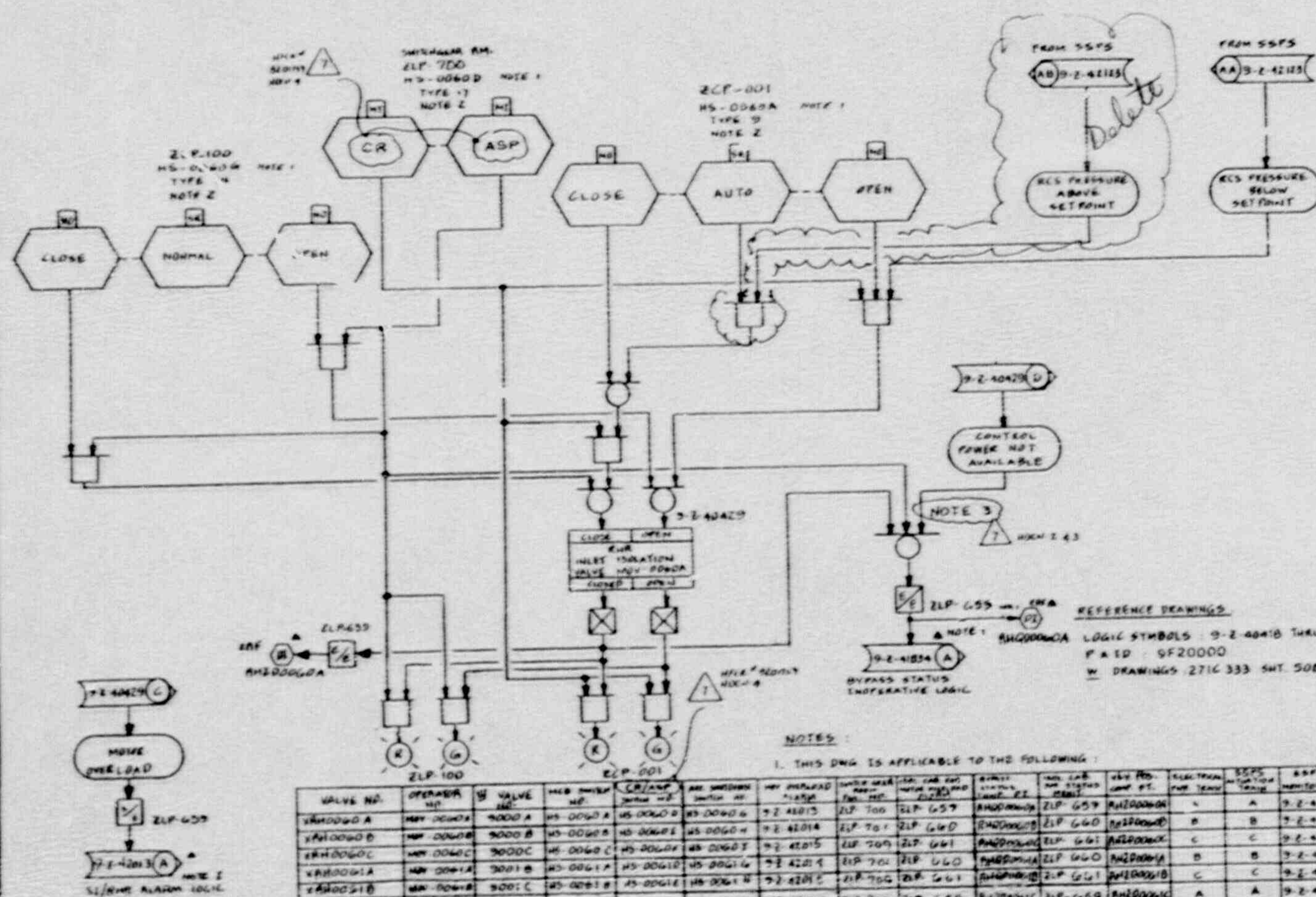
THIS DWG REPRESENTS FUNCTIONAL REQUIREMENTS ONLY

SOUTH TEXAS PROJECT UNITS 1 & 2

RHR INLET ISOLATION VALVES LOGIC DIAGRAM SYSTEM: RH (Sheet 1 of 2)

Dwg. No. 5R16-9-Z-42182 #1 Rev. 8

Figure 7.6-2 Revision 0



REFERENCE DRAWINGS:

LOGIC SYMBOLS: 9-Z-40418 THRU 40421.

P & ID: 9F20000

W DRAWINGS 2716 333 SHT. 508 THRU 513.

NOTES:

1. THIS DWG IS APPLICABLE TO THE FOLLOWING:

VALVE NO.	OPERATOR NO.	VALVE NO.	MCB SWITCH NO.	CR/ASP SWITCH NO.	[illegible] SWITCH NO.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ELECTRICAL [illegible] TRAIN	SSPS ACTUATION TRAIN	[illegible] MONITORING	ELECTRICAL REF. DWG
XRH0060A	MOV-0060A	9000A	HS-0060A	HS-0060D	HS-0060G	9-Z-42013	ZLP-700	ZLP-659	RH0060A	ZLP-659	RH0060A	A	A	9-Z-41834	9-E-RH03-01
XRH0060B	MOV-0060B	9000B	HS-0060B	HS-0060E	HS-0060H	9-Z-42014	ZLP-701	ZLP-660	RH0060B	ZLP-660	RH0060B	B	B	9-Z-41864	9-E-RH03-01
XRH0060C	MOV-0060C	9000C	HS-0060C	HS-0060F	HS-0060I	9-Z-42015	ZLP-709	ZLP-661	RH0060C	ZLP-661	RH0060C	C	C	9-Z-41891	9-E-RH03-1
XRH0061A	MOV-0061A	9001B	HS-0061A	HS-0061D	HS-0061G	9-Z-42014	ZLP-701	ZLP-660	RH0061A	ZLP-660	RH0061A	B	B	9-Z-41864	9-E-RH02-01
XRH0061B	MOV-0061B	9001C	HS-0061B	HS-0061E	HS-0061H	9-Z-42015	ZLP-709	ZLP-661	RH0061B	ZLP-661	RH0061B	C	C	9-Z-41891	9-E-RH02-01
XRH0061C	MOV-0061C	9001A	HS-0061C	HS-0061F	HS-0061I	9-Z-42013	ZLP-700	ZLP-659	RH0061C	ZLP-659	RH0061C	A	A	9-Z-41834	9-E-RH02-01

2. FOR SWITCH TYPES SEE DWG. 9-Z-40421.

3. THIS INPUT IS APPLICABLE ONLY TO MOV'S 0060A, 0060B & 0060C.

GENERAL NOTE:

THIS DWG REPRESENTS FUNCTIONAL REQUIREMENTS ONLY.

SOUTH TEXAS PROJECT
UNITS 1 & 2

RHR INLET ISOLATION VALVES
LOGIC DIAGRAM SYSTEM: RH
(Sheet 2 of 2)

Dwg. No. 5R16-9-Z-42182 #2 Rev. 8

Figure 7.6-2

Revision 0