

COMANCHE PEAK STEAM ELECTRIC STATION UNITS I & II

ALTERNATE SHUTDOWN STUDY

FINAL REPORT

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1.0 INTRODUCTION

A catastrophic fire in the CPSES Unit I or II control room (CR), cable spreading room (CSR) or at the hot shutdown panel (HSP) was the basis for this study. The design basis for such a catastrophic event was the "transient exposure fire" required to be postulated by NRC Branch Technical Position (BTP) APCSB 9.5-1. Of the three locations, either the CR or CSR area fire was the controlling case regarding design changes as compared to the HSP location. By circuitry changes and equipment rearrangement at the HSP area, the design was changed to ensure complete isolation of the CR and thus enable safe shutdown of the plant from either the CR or the HSP.

It should be noted that the original design of the HSP required only the postulated evacuation of the CR for an unspecified non-catastrophic event. No damage to equipment in the CR or CSR was assumed in the analysis of equipment required to meet General Design Criteria 19: to enable reactor shutdown from outside the CR. Hence, the transient exposure fire represents a fundamental departure from this concept.

2.0 PURPOSE

The purpose of this study was:

- a. To analyze the effect on CPSES Unit I or II control system of a major fire in either the CR, the CSR, the HSP or the new Shutdown Transfer Panel (STP).
- b. To suggest a means of achieving hot standby, and subsequent cold shutdown, in spite of the postulated destruction by fire.
- c. To revise the existing control systems with the least impact on construction, existing documentation and interfaces with instrument or equipment suppliers.
- d. To incorporate in these changes human factors engineering principles in order to make the operators' work station (i.e., the HSP) simple and effective in aiding them to shut the plant down safely in the event of this postulated destructive fire.

Major assumptions made in addressing alternate shutdown capability per the BTP were as follows:

- a. The unit, while operating at full power, develops a serious fire in one of the areas postulated.
- b. The unit is brought to hot standby (reactor and turbine tripped, systems at no-load pressure and temperature) immediately, and is, subsequently, capable to proceed to cold shutdown within 72 hours.
- c. Loss of offsite power may occur with the generator trip.
- d. Shutdown will be achieved using one train of shutdown systems, either Train "A" or "B."
- e. No additional single or multiple failures or events are considered concomitant with the postulated fire. Spurious signals emanating from equipment in the fire zone are considered.
- f. The alternate shutdown system is important to safety, but is not Class 1E. It is a combination of Class 1E and non-Class 1E controls and monitors. Class 1E control systems, if revised, shall have Class 1E components. Alternate shutdown is primarily intended to overcome fire damage unaccompanied by a LOCA or other accidents that render systems incapable of performing their intended functions.

3.0 METHODS AND GENERAL ANALYSIS OF STUDY AND FINAL DESIGN

3.1 METHODS OF STUDY

In order to examine alternate shutdown capability, a shutdown logic diagram (Sketch XB-2323-1800, Sh. 0-15), Attachment I, was developed to show the existing control schemes for CPSES I or II. It also shows those portions of systems and components, required for shutdown, that were disabled by the postulated fire. A detailed discussion of shutdown logic sketch XB-2323-1800 is contained in Section 4 of this report.

In addition, mini-P & IDs were also developed to portray essential equipment, instrumentation and flow paths in order to facilitate analysis and understanding of the shutdown capability sought. Instruments and controls indicated in the P&ID are the actual controls located at the front of the panels and doesn't show complete interlocks. For details refer to individual ICD's. The following attachments are tabulated below:

List of P&ID's

<u>Dwg. No.</u>	<u>System</u>	<u>FIRE</u>		
		<u>CR</u>	<u>HSP</u>	<u>STP</u>
1A	SSW System	X		
1B	SSW System		X	
1C	SSW System			X
2A	CCW System	X		
2B	CCW System		X	
2C	CCW System			X
3A	SG Inventory Control	X		
3B	SG Inventory Control		X	
3C	SG Inventory Control			X
4A	SG Pressure Control	X		
4B	SG Pressure Control		X	X
5A	RCP Seal Integrity, Reactivity Control and RCS Inventory Control	X		
5B	RCP Seal Integrity, Reactivity Control and RCS Inventory Control		X	
5C	RCP Seal Integrity, Reactivity Control and RCS Inventory Control			X
6A	RCS Pressure Control	X		
6B	RCS Pressure Control		X	
C	RCS Pressure Control			X
7A	Chilled Water System, Room Ventilation and Diesel Generators	X		
7B	Chilled Water System, Room Ventilation and Diesel Generators		X	
7C	Chilled Water System, Room Ventilation and Diesel Generators			X

3.2 GENERAL ANALYSIS OF STUDY

3.2.1 A major fire in the CR or CSR, just beneath the CR, could disable systems needed for either hot standby or cold shutdown of the plant. Most of the instrument loops are powered from the CR and all interlocking signals for automatic controls, such as safety injection

or blackout, originate in the CR. A fire at the HSP area could result in the destruction of transfer switches (local/remote), normally in the remote position, of safe shutdown equipment for both Trains "A" and "B."

3.2.2 A majority of the CPSES Unit I and II control systems reviewed are in a "series" configuration as shown in Figure 1, Attachment 2. In this arrangement, transmitters send analog signals to the CR where they are indicated or monitored and retransmitted to the HSP to perform the same function as in the CR. Their power supply, however, is in the CR. It, therefore, becomes evident that if either the CR or CSR is seriously damaged, the HSP is also inoperative.

3.2.3 All of the changes required, as a result of the analysis of safe shutdown paths, were reduced to the four general cases described below.

Case 1. For simple indicating loops, another transmitter was added alongside the existing transmitter, and terminated at the HSP. Existing indicators on the HSP, provided by G&H or W, were used. In addition, a new power supply was added at the STP (and, thus unaffected by the CR fire) and existing wiring between the CR and the HSP was disconnected. See Figure 2, Attachment 3.

Case 2. For complex loops with indication and control functions, new transmitters were added (alongside existing transmitters) and were terminated at the HSP. Final control signals emanating from either the CR or the HSP are now routed to the transfer panel and through a local/remote selector switch to the final control element. Existing instrumentation at the HSP, provided by G&H or W, was used as in Case 1 above and existing wiring between the CR and the HSP was disconnected. See Figure 3, Attachment 4.

Case 2A. The existing transmitter was rerouted to a selector switch added at the STP. The final element will be controlled from either the CR or the HSP as selected at the transfer panel. See Figure 3A, Attachment 5.

Case 3. For train "A" motor operated valves needed for safe shutdown, that are controlled from the

control room, wiring was revised so that the final control signal passes through a selector switch added to the STP. A hand switch was added to the HSP, thus, control of the Train "A" valve can be obtained from either the CR or the HSP as selected from the transfer panel. In addition, valve position lights for the Train B valve were added to the HSP. See Figure 4, Attachment 6.

Case 4. Train "A" equipment required for safe shutdown already had their selector switches and local control switches located on the HSP. The selector switches were relocated to the STP and control switches remain at the HSP. In addition, "equipment running" lights were added to the HSP. See Figure 5, Attachment 7.

3.2.4 If a CR design basis fire is postulated, offsite power may be lost. If available, the RC pumps are allowed to run (forced circulation). If lost, cooling without forced RC flow (natural circulation cooldown) introduces certain simplifications in control system design. The operator has the option of deciding between forced or natural circulation. In the event of a CR fire, the RCPs can be manually tripped at the switchgear. To shut down the plant, the Train "A" diesel generator would be manually started along with the component cooling water, service water, and chilled water systems and associated emergency room fan-coolers for this equipment (Train "A").

Many fluid flow paths, such as component cooling water to and from the reactor containment, consist of either "parallel" or "series" valve connections, depending on the design. Train "A" and Train "B" valves in series are designed to close on a containment isolation signal. A parallel connection of Train "A" and Train "B" valves is usually designed to open to mitigate the effects of a postulated accident. In the case of a design basis CR fire, the objective is to shut down the plant in an orderly manner, assuming only one source of power supply available. Reversing the intended function of the valve arrangement would now become important. For example, flow of component cooling water (CCW) into the reactor building for RCP cooling must be maintained even if Train "B" power and control is lost due to the design basis fire causing its Train "B" powered isolation valves to close.

CCW isolation valves in the fluid flow path are in series, one powered from Train "A" and the other from Train "B." Although most of these valves are motor-operated and fail "as-is" on loss of power, the occurrence of a spurious signal from a burning control room must be considered. To preclude mispositioning of key Train "B" valves, the design changes described below were made.

- 3.2.5 The problem of transferring control of circuits, automatically controlled before the postulated fire, to manual control, for all systems involved in this study, has been carefully reviewed. The bumps associated with transfer are considered of minimal consequence since most of the valves controlled or MOVs, are slow acting. Bumps associated with pump starts can be mitigated by prescribing procedures to enable regulation of bypass and discharge flow.
- 3.2.6 Detail analysis of communication systems, emergency lighting and access are not included in this report.
- 3.2.7 All high pressure/low pressure interfaces with the RCS have been identified and listed in Table 4. The design has been modified to ensure that no LOCA would result as a consequence of the postulated catastrophic fires.

3.3 FINAL DESIGN

In order to preclude a spurious signal from mispositioning the key Train "A" and "B" valves and to protect at least 1 safety train ("A" or "B"), during a CR/CSR or HSP fire the following was accomplished:

1. Installed a new Shutdown Transfer Panel (STP) for key train "A", "C" and associated train "AA" equipment transfer switches. These included pumps, valves, switchgears and power supplies for analog instruments.

Control circuits now have 2 sets of readily accessible fuses.

2. Shutdown control systems of Train "A" were revised to be completely independent of the CR. Essential Train "B" valves in series with vital Train "A" valves now have indicating lights at the HSP. These lights are independent of A-C power sources (Train "B" or "C" battery) and are not affected by a CR/CSR fire.
3. Running lights for vital equipment are provided at the HSP. Process indication, control switches and indicating lights are functionally grouped for ease of operation.

4. Procedures proposed now incorporate specific actions of the operator in case of a design basis CR, CSR, HSP or STP fire. Tables 1 through 3 below tabulate procedures to be followed for each postulated fire. The tables provided are for Unit I Instruments and Controls and are typical for Unit II. Note that procedures proposed are preliminary guides that augment this study. Actual, final detailed procedures will be developed by TUGCO.

TABLE 1A

PROCEDURE TO BE FOLLOWED FOR FIRE IN CSR/CR
 (Only Train "A" Equipment Required)

OPERATOR'S WORK STATION	PROCEDURES
CR	1. Prior to evacuating CR, trip the Reactor, Turbine & Generator.
STP	2. Transfer all Sel-Switches at the STP from "Remote" To "Local." See Table No. 1B and Fig. 6, Attachment No. 8.
	3. Start Essential Equipment
D.G. Local Control Panel	A. Diesel Gen. "A" and Auxiliaries
	A.1 Emergency start switch for DG "A" (No Tag No.) and HS-3375A F.O. Transfer Pump
HSP	A.2 CCW PP No. 1 HS-4518C
HSP	A.3 SW PP No. 1 HS-4250C
HSP	A.4 Chilled Water Recirculation PP No. 6700, HS-6700 FL
HSP	B. Charging PP APCH 1/1-APCH1L
HSP	B.1 Boric Acid Transfer PP No. APBA1 1/1-APBA1L
HSP	C. Aux. Feedwater PP No. 1 HS-2450C
Local Panel	D. Emergency Fan Room Coolers (Local Area) such as
Local Panel	D.1 Diesel Generator "A" Room Fans HS-5691A3, HS-5691B3 5691C3, 5691D3, and 5691E3

Table 1A (Continued)

WORK STATION	PROCEDURES
Local Panel	D.2 Electrical Area Train "A" Room Coolers El-810'-0" HS-5684B3 (SE-17) HS-5684A3 (SE-18)
Local Panel	D.3 CCW Pump Room Cooler HS-5800C(SE-07)
Local Panel	D.4 Aux. Feedwater PP Room Cooler HS-5676C (SE-07)
Local Panel	D.5 Charging PP Emergency Fan HS-5802C (SE-03)
Local Panel	D.6 RHR PP 01 Room Cooler (CSD HS-5668 (SE-01)
HSP	E. RHR PP No. 01 (CSD 1/1-APRH1L)
Local Panel	4. While the above equipment is being started, other operators at the same time are tripping the Power Circuit Breakers at the MCC of all Train "B" motor operated valves that are in flow line of safe shutdown systems to preclude spurious signals from mispositioning these valves
HSP	5. Verify position of Train "B" valves using monitor light box MLB-63 at the HSP Train "B." If any of these valves are out of alignment (light on), the operator shall direct other operators to manually operate the misaligned valves. See Table 1 C.

TABLE 1B

TRANSFER SWITCHES LOCATED ON STP

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>FUNCTION/DESCRIPTION</u>
1.	HS-2450B	MOT DRVN AFWP-1 REMOTE LOCAL
2.	HS-2453AF	MOT DRVN AFWP-1 TO SG-1 CNTR VLV REMOTE LOCAL
3.	HS-2453BF	MOT DRVN AFWP-1 TO SG-2 CNTR VLV REMOTE LOCAL
4.	HS-2456FT	MOT DRVN AFWP-1 RECIRC VLV REMOTE LOCAL
5.	HS-2452B	TURB DRVN AFWP STM SPLY HDR #1 VLV REMOTE LOCAL
6.	HS-4250B	SSW PMP-1 REMOTE LOCAL
7.	HS-4286FT	SSW PMP-1 DSCH VLV REMOTE LOCAL
8.	HS-4393FT	DSL GEN-A SER WTR CENTR VLV REMOTE LOCAL
9.	HS-4699FT	CCW TO RC PMP COOLERS ISO VLV REMOTE LOCAL
10.	HS-4701FT	RCP MOT AIR AND LUBE OIL COOLERS CCW RETURN HDR ISO VLV REMOTE LOCAL
11.	HS-4518B	CCW PMP-1 REMOTE LOCAL
12.	HS-4514FT	CCW HX TO NON-SAFETY LOOP-1 CNTR VLV REMOTE LOCAL
13.	HS-4524FT	NON-SAFETY LOOP RET TO CCW HDR ISO VLV REMOTE LOCALt+1
14.	HS-4526FT	CCW TO NON-SAFETY LOOP ISO VLV REMOTE LOCAL
15.	SPARE	

TABLE 1B (Continued)

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>FUNCTION/DESCRIPTION</u>
16.	43/1-APCH1L	CENT CHRG PUMP-1 REMOTE LOCAL
17.	43/1-APBAIL	BORIC ACID TRANS PUMP-1 REMOTE LOCAL
18.	43/1-TCV-129	LTDN TO DEMINER OR VOL CNTR TK REMOTE LOCAL
19.	43/1-8106FT	CHRG PMPS TO RCS ISO VLV REMOTE LOCAL
20.	43/1-8801AF	CHRG PMPS TO RCS SIS ISO VLV REMOTE LOCAL
21.	43/1-8149AL	CVCS LTDN ORFC ISO VLV REMOTE LOCAL
22.	43/1-8149BL	CVCS LTDN ORFC ISO VLV REMOTE LOCAL
23.	43/1-8149CL	CVCS LTDN ORFC ISO VLV REMOTE LOCAL
24.	43/1-8110FT	CHRG PMP MINIFLOW/ISO VLV REMOTE LOCAL
25.	43/1-121-FT	PRZR LVL CNRL VLV REMOTE LOCAL
26.	43/1-APRH1F	RHR PMP-1 REMOTE LOCAL t+1
27.	43/1-8701AF	RHR LOOP 1 INLET ISO VLV REMOTE LOCAL
28.	43/1-8701BF	RHR LOOP 2 INLET ISO VLV REMOTE LOCAL
29.	SPARE	
30.	HS-5405B	CONT RECIRC FAN 01 REMOTE LOCAL
31.	HS-2333FT	MS LOOP 1 ISO AND BYPASS VLVS REMOTE LOCAL

TABLE 1B (Continued)

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>FUNCTION/DESCRIPTION</u>
32.	HS-2334FT	MS LOOP 2 IS AND BYPASS VLVS REMOTE LOCAL
33.	HS-2335FT	MS LOOP 3 ISO AND BYPASS VLVS REMOTE LOCAL
34.	HS-2336FT	MS LOOP 4 ISO AND BYPASS VLVS REMOTE LOCAL
35.	HS-5413B	CONT RECIRC FAN 03 REMOTE LOCAL
36.	43/1-455AFT	PRZR PWR REIEF VLV REMOTE LOCAL
37.	43/1-PCPR1L	PRZR HTR BACKUP GROUP-A REMOTE LOCAL
38.	1-HS-XT	WTR CHILLER CNTR REMOTE LOCAL
39.	HS-6700FT	CH WTR RECIRC PMP-5 REMOTE LOCAL
40.	SPARE	
41.	43/1EA1-1	INCOMING BKR 1EA1-1 REMOTE LOCAL
43.	43/1EA1-2	INCOMING BKR 1EA1-2 REMOTE LOCAL
42.	43/1EG1	DIESEL GEN BKR 1EG1 REMOTE LOCAL
44.	43/BT-1EA1	TIE BKR BT-1EA1 REMOTE LOCAL
45.	SPARE	
46.	43/T1EB1	BUS 1EA1 TRANSFER T1EB1 FEEDER BKR REMOTE LOCAL
47.	43/1EB1-1	INCOMING BKR 1EB1-1 REMOTE LOCAL
48.	43/T1EB3	BUS 1EA1 TRANSFER 1EB3 FEEDER BKR REMOTE LOCAL

TABLE 1B (Continued)

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>FUNCTION/DESCRIPTION</u>
49.	43/1EB3-1	INCOMING BKR 1EB3-1 REMOTE LOCAL
50.	43/BT-1EB13	TIE BKR BT-1EB13 REMOTE LOCAL

TABLE 1C

VALVES REQUIRED FOR SHUTDOWN (CR FIRE)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>HSP INDICATION OR CONTROL</u>
1.	HV-2491B	"B"	AFW to STM GEN No. 1	Open	WL-2491BF**
2.	HV-2492B	"B"	AFW to STM GEN No. 2	Open	WL-2492BF**
3.	PV-2453A	"A"	Aux. Feedwater Press Control	Open	FK-2453C
4.	PV-2453B	"A"	Aux. Feedwater Press Control	Open	FK-2453D
5.	HV-4393	"A"	SW from Diesel GEN. "A"	Open	HS-4393FL
6.	1/1-8351A	"B"	Seal Inj. Inlet RCP No. 1	Open	WL-8351AF**
7.	1/1-8351B	"B"	Seal Inj. Inlet RCP No. 2	Open	WL-8351BF**
8.	1/1-8351C	"B"	Seal Inj. Inlet RCP No. 3	Open	WL-8351CF**
9.	1/1-8351D	"B"	Seal Inj. Inlet RCP No. 4	Open	WL-8351DF**
10.	1/1-8110	"A"	Charging PPs Min. Recir. Valve	Open	1/1-8110FL
11.	1/1-8111	"B"	Charging PPs Min. Recir. Valve	Open	WL-8111F**
12.	1/1-8801A	"A"	Charging PP Disch Isol. Valve	Close	1/1-8801AF
13.	1/1-8801B	"B"	Charging PP Disch Isol. Valve	Close	WL-8801BF**
14.	1/1-8104	"B"	Charging PPs Inlet Control Valve	Open	WL-8104BF**

* Local Manipulation of Valve Required

** Monitor Lights on MLB-63

***Alternate Power (TR."A") Capability is Being Provided.

TABLE 1C (Continued)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>HSP INDICATION OR CONTROL</u>
15.	1/1-8106	"A"	Charging PPs Disch to CVCS Isol. Valve	Close	1/1-8106FL
16.	1CS-8444	"B"	Charging PPs Inlet Isol. Valve	Close	None*
17.	FCV-121	"C"	Pressurizer Level Control	Open	FK-121A
18.	HV-4515	"B"	CCW Train "B" Isol. Valve	Close	WL-4515F**
19.	HV-4525	"B"	CCW Flow From Non Safe-Guards Loop	Open	WL-4525F**
20.	HV-4527	"B"	CCW Flow to Non Safe-Guards Loop	Open	WL-4527F**
21.	HV-4700	"B"	CCW Flow Inlet Header to RCP Coolers	Open	WL-4700F**
22.	HV-4708	"B"	CCW Flow Return Header From RCP	Open	WL-4708F**
23.	HV-4514	"A"	CCW Train "A" Isol. Valve	Open	HS-4514FL
24.	HV-4524	"A"	CCW Flow to Non Safe-guard Loop	Open	HS-4524FL
25.	HV-4526	"A"	CCW Flow From Non Safeguard Loop	Open	HS-4526FL
26.	HV-4699	"A"	CCW Inlet Flow to RCP Coolers	Open	HS-4699FL
27.	HV-4701	"A"	CW Return Flow From RCP Coolers	Open	HS-4701FL
28.	HV-4286	"A"	SW Disch. Isol. Valve	Open	HS-4286FL

* Local Manipulation of Valve Required

** Monitor Lights on MLB-63

***Alternate Power (TR. "A") Capability is Being Provided.

TABLE 1C (Continued)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>HSP INDICATION OR CONTROL</u>
29.	1/1-8702A	"B"	RHR Suction Isol. Valve (HSD, HSB)	Close	None 1/1-8701A (TR "A" CLOSE) ***
			(CSD)	Open	
30.	1/1-8702B	"B"	RHR Suction Isol. Valve (HSD, HSB)	Close	None 1/1-8701B (TR "A" CLOSE) ***
			(CSD)	Close	
31.	1/1-8701A	"A"	RHR Inlet Isol. Valve (HSD, HSB)	Close	1/1-8701AF
			(CSD)	Open	1/1-8701AF
32.	1/1-8701B	"A"	RHR Inlet Isol. Valve (HSD)(HSB)	Close	1/1-8701BF
			(CSD)	Close	1/1-8701BF
33.	HCV-606	"C"	RHR Disch Control Valve	Open	HC-606 See Table 6
34.	FCV-618	"C"	RHR Min. Flow Valve	Close	HC-618 See Table 6
35.	FCV-610	"A"	RHR Min. Flow Valve	Close	None*
36.	1/1-8809A	"A"	RHR Disch Isol. Valve	Open	None*
37.	1/1-8716A	"A"	RHR Cross Connect Valve	Close	None*
38.	1/1-8812A	"A"	RHR Suction Cross- connect	Close	None*

* Local Manipulation of Valve Required

** Monitor Lights on MLB-63

***Alternate Power (TR. "A") Capability is Being Provided.

TABLE 1C (Continued)

<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>HSP INDICATION OR CONTROL</u>
39. 1/1-8808A	"A"	S1 Accumulator Tank Isol. Valve	(CSD) Close	None- Manually By Jumpering @ MCC Indicating Lights Provided @ MCC
40. 1/1-8808B	"B"	S1 Accumulator Tank Isol. Valve	(CSD) Close	None- Manually By Jumpering @ MCC Indicating Lights Provided @ MCC
41. 1/1-8808C	"A"	S1 Accumulator Tank Isol. Valve	(CSD) Close	None- Manually By Jumpering @ MCC Indicating Lights Provided @ MCC
42. 1/1-8808D	"B"	S1 Accumulator Tank Isol. Valve	(CSD) Close	None- Manually By Jumpering @ MCC Indicating Lights Provided @ MCC
43. PV-2325	"A"	SG No. 1 PORV	Close	HC-2325 See Table 6
44. PV-2327	"A"	SG No. 3 PORV	Close	HC-2327 See Table 6
45. PV-2326	"B"	SG No. 2 PORV	Close	HC-2326 See Table 6

* Local Manipulation of Valve Required

** Monitor Lights on MLB-63

***Alternate Power (TR."A") Capability is Being Provided.

TABLE 1C (Continued)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>HSP INDICATION OR CONTROL</u>
46.	PV-2328	"B"	SG No. 4 PORV	Close	HC-2328 See Table 6
	PV-5180	"C"	SG Blowdown Drains	Close	HS-5180F
48.	HV-4395	"A"	SW to Aux Feedwater PP	Close	None*
49.	1/1-8149A	"A"	Letdown Isol. Valve	Close	1/1-8149AL
50.	1/1-8149B	"A"	Letdown Isol. Valve	Close	1/1-8149BL
51.	1/1-8149C	"A"	Letdown Isol. Valve	Close	1/1-8149CL
52.	PCV-455A	"A"	Pressurizer PORV	Close	1/1-455AFL
53.	PCV-456	"B"	Pressurizer PORV	Close	1/1-456FL
54.	1/1-8153	"B"	RCS Excess Letdown Isol. Valve	Close	1/1-8153 FL
55.	HV-2333A&B	"A"	Main Steam Isol. & By- Pass Valve	Close	HS-2333FL
56.	HV-2334A&B	"A"	Main Steam Isol. & By- Pass Valve	Close	HS-2334FL
57.	HV-2335A&B	"A"	Main Steam Isol. & By- Pass Valve	Close	HS-2335FL
58.	HV-2336A&B	"A"	Main Steam Isol. & By- Pass Valve	Close	HS-2336FL
59.	HV-4512	"A"	CCW Isol. Valve	Open	None-*
60.	HV-4513	"B"	CCW Isol. Valve	Close	None-*

* Local Manipulation of Valve Required

** Monitor Lights on MLB-63

***Alternate Power (TR."A") Capability is Being Provided.

TABLE 1D

INSTRUMENTATION AND CONTROL LOCATED ON HSP
TRAIN "A" & "C"

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
1	HS-4250C	"A"	SSW Pump 01 - Local Control
2	HS-4518C	"A"	CCW Pump 01 - Local Control
3	HS-4286FL	"A"	SSW PMP 01 Disch. to Strainer Isol VLV
4	HS-4514FL	"A"	CCW HX to Non-Safety Loop 01 Control VLV
5	HS-4526FL	"A"	CCW HX Non-Safety Loop Isol. VLV
6	HS-4699FL	"A"	CCW to RC PPs Coolers Motor Operated Isolation VLV
7	HS-4524FL	"A"	Non-Safety Loop Return to CCW HDR Isol. VLV
8	HS-4701FL	"A"	CCW from RCP Motor Air & Lube Oil Coolers Motor Operated Isol. VLV
9	HS-4393FL	"A"	Diesel Gen A Service WTR Isolation VLV
10	FK-121A	"C"	Pressurizer Level Control Valve (Charging Flow Control)
11	1/1-8149AL	"A"	Letdown Valve 8149A - Control
12	1/1-8149BL	"A"	Letdown Valve 8149B - Control
13	1/1-8149CL	"A"	Letdown Valve 8149C - Control
14	SK-2452B	"AA"	Turbine-Driven AFW Pump - Speed Control
15	SI-2452B	"AA"	Turbine-Driven AFW Pump - Speed Indication

TABLE 1D (Continued)

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
16	HS-2452C	"A"	Turbine-Driven AFW Pump - Local Control
17	FK-2453C	"A"	Motor-Driven AFW Pump 01 to SG No. 1 Valve Control
18	FK-2453D	"A"	Motor-Driven AFW Pump 01 to SG No. 2 Valve Control
19	FK-2461B	"A"	Turbine-Driven AFW Pump to SG No. 3 Valve Control
20	HS-2333-FL	"A"	Main STM Loop 1 Isolation & Bypass VLV
21	HS-2334-FL	"A"	Main STM Loop 2 Isolation & Bypass VLV
22	HS-2335-FL	"A"	Main STM Loop 3 Isolation & Bypass VLV
23	HS-2336-FL	"A"	Main STM Loop 4 Isolation & Bypass VLV
24	FK-2462B	"A"	Turbine-Driven AFW Pump to Steam Generator 4 Valve Control
25	1/1-PCPR1L	"AA"	Pressurizer Heater Backup - Group A Control
26	FI-121B	"C"	Charging Pump to CVCS Charging and RCP Seals - Flow
27	FI-132B	"C"	Letdown - Flow
28	1/1-TCV-129L	"A"	Letdown Divert Valve TCV-129 - Control
29	HS-5405C	"AA"	Containment Recirculation Fan 01 Control Switch
30	TR-413F/423F	"C"	(2 Pen Recorder) Wide Range Reactor Coolant Temp. Hot Leg Loop 1 & Loop 2

TABLE 1D (Continued)

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
31	1/1-8701AF	"A"	RCS Hot Leg Loop 1 to RHR Pump 01 Inlet Isol. VLV Control Switch
32	1/1-8701BF	"A"	RCS Hot Leg Loop 4 to RHR Pump 02 Inlet Isol. VLV Control Switch
33	1/1-8801AF	"A"	CHRG PMPS TO RCS SIS Isol. VLV Control Switch
34	1/1-APRH1F	"A"	RHR Pump 01 Control Switch
35	HS-5413C	"AA"	Containment Recirculation Fan 03 - Control
36	FI-2463B	"C"	AFW to Steam Generator 1 - Flow
37	FI-2464B	"C"	AFW to Steam Generator 2 - Flow
38	FI-2465D	"C"	AFW to Steam Generator 3 - Flow
39	FI-2466D	"C"	AFW to Steam Generator 4 - Flow
40	PI-2477B	"C"	Turbine-Driven AFW Pump - Suction Pressure
41	PI-2455B	"C"	Turbine-Driven AFW Pump - Discharge Pressure
42	PI-2475B	"C"	Motor-Driven AFW Pump 01 - Suction Pressure
43	PI-2453B	"C"	Motor-Driven AFW Pump 01 - Discharge Pressure
44	FI-4258B	"C"	SSW Pump 01 - Flow
45	HS-6700FL	"A"	Chilled Water Recirc. PP 05
46	PI-4252B	"C"	SSW Pump 01 - Discharge Pressure
47	V-1EA1-L	"A"	6.9 kV Bus 1EA1 - Voltage
48	F-1EA1-L	"C"	6.9 kV Bus 1EA1 - Frequency

TABLE 1D (Continued)

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
49	A-1EA1-1L	"A"	6.9KV Bus 1EA1 - Preferred Offsite Source - Amperes
50	A-1EG1-L	"A"	6.9KV Bus 1EA1 - Onsite Source - Amperes
51	A-1EA1-2L	"A"	6.9KV Bus 1EA1, Alternate Offsite Source - Amperes
52	CS-1EA1-1L	"A"	6.9KV Bus 1EA1, Preferred Offsite Source Breaker-Control Switch
53	CS-1EG1-L	"A"	6.9KV Bus 1EA1, Onsite Source Breaker - Control Switch
54	CS-1EA1-2L	"A"	6.9KV Bus 1EA1, Alternate Offsite Source Breaker-Control Switch
55	CS/BT1EB13L	"A"	480 V Switchgear Bus 1EB1 & 1EB3 Bus Tie BKR No. BT-1EB13 Control Switch
56	CS/1EB1-1L	"A"	480 V Switchgear Bus 1EB1 Supply BKR No. 1EB1-1 Control Switch
57	CS/1EB3-1L	"A"	480 V Switchgear Bus 1EB3 Supply BKR No. 1EB3-1 Control Switch
58	CS/BT1EA1L	"A"	6.9 kV Switchgear Bus 1EA1 Bus Tie BKR No. BT-1EA1 Control Switch
59	CS/T1EB1L	"A"	6.9 kV Switchgear Bus 1EA1 Transfer TIEB1 Feeder BKR Control Switch
60	CS/T1EB3L	"A"	6.9 kV Switchgear Bus 1EA1 Transfer TIEB3 Feeder BKR Control Switch
61	LI-501A	"C"	Steam Generator 1 - Level
62	LI-502A	"C"	Steam Generator 2 - Level
63	PI-514B	"C"	Steam Generator 1 - Pressure
64	PI-524B	"C"	Steam Generator 2 - Pressure
65	LI-459B	"C"	Pressurizer - Level

TABLE 1D (Continued)

<u>ITEM NO.</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
66	PI-455B	"C"	Pressurizer - Pressure
67	LI-2478B	"C"	Condensate Storage Tank - Level
68	HS-2450C	"A"	Motor-Driven AFW Pump 01 - Local Control
69	1/1-APCH1L	"A"	Charging Pump 1 - Control
70	1/1-APBA1L	"A"	Boric Acid Transfer Pump 1 - Control
71	1/1-8106FL	"A"	Charging Pump to RCS Isol. VLV Control Switch
72	HS-2456FL	"A"	Motor Driven Aux FW PP 01 Recirc.
73	1/1-455AFL	"A"	Pressurizer PORV Control Switch
74	ZL-2475B	"A"	Aux FW PMP Suction
75	ZL-2453C	"A"	Mot Drvn AFW PMP 01 Disch to SG 1 Control VLV
76	ZL-2461B	"A"	Turb Dr AFW PMP Disch to SG 3 Control VLV
77	ZL-2453D	"A"	Mot Drvn AFW PMP 01 Disch to SG 2 Control VLV
78	ZL-2462B	"A"	Turb Dr AFW PMP Disch to SG 4 Control VLV
79	TI-443	"C"	W-RNG RCS Temp.
80	NI-31F	"C"	Source Range - Neutron PWR
81	1/1-8110FL	"A"	Charging PMPS Bypass VLV

TABLE 1E

INSTRUMENTATION AND CONTROL LOCATED ON
HSP TRAIN "B" & "C"

<u>ITEM NO</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
1	1/1-APBA2L	"B"	Boric Acid Transfer Pump 2 Control
2	43/1-APBA2L	"B"	Boric Acid Transfer Pump 2 Local/Remote
3	HS-4251C	"B"	SSW Pump 2 - Local Control
4	HS-4519C	"B"	CCW Pump 2 - Local Control
5	HS-4519B	"B"	CCW Pump 2 - Local/Remote
6	HS-2452E	"B"	Turbine-Driven AFW Pump - Local Control
7	HS-2452D	"B"	Turbine-Driven AFW Pump - Local/Remote
8	FK-2459B	"B"	Turbine-Driven AFW Pump To Steam Generator 1 - Valve Control
9	FK-2460B	"B"	Turbine-Driven AFW Pump To Steam Generator 2 - Valve Control
10	FK-2454C	"B"	Motor-Driven AFW Pump 02 to Steam Generator 3-Valve Control
11	FK-2454D	"B"	Motor-Driven AFW Pump 02 to Steam Generator 4-Valve Control
12	1/1-PCPR2L	"BB"	Pressurizer Heater Backup - Group B Control
13	43/1-PCPR2L	"BB"	Pressurizer Heater Backup - Group B Local/Remote
14	FI-183B	"C"	Boric Acid Filter Recovery Line - Flow
15	1/1-8104L	"B"	Emergency Boration Valve - Control

TABLE 1E (Continued)

<u>ITEM NO</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
16	43/1-8104L	"B"	Emergency Boration Valve Transfer - Local/Remote
17	TR-433F/443F	"C"	(2 Pen Recorder) Wide Range Reactor Coolant Temp. Hot Leg. Loop 3 & Loop 4
18	HS-5409B	"BB"	Containment Recirculation Fan 02 - Control
19	HS-5409C	"BB"	Containment Recirculation Fan 02 - Local/Remote
20	HS-5417C	"BB"	Containment Recirculation Fan 04 - Control
21	HS-5417B	"BB"	Containment Recirculation Fan 04 - Local/Remote
22	FI-2463D	"C"	AFW to Steam Generator 1 - Flow
23	FI-2464D	"C"	AFW to Steam Generator 2 - Flow
24	FI-2465B	"C"	AFW to Steam Generator 3 - Flow
25	FI-2466B	"C"	AFW to Steam Generator 4 - Flow
26	PI-2476B	"C"	Motor-Driven AFW Pump 02 - Suction Pressure
27	PI-2454B	"C"	Motor-Driven AFW Pump 02 - Discharge Pressure
28	ZL-455CF	"C"	PRZR Spray VLV Position Indicator
29	ZL-455BF	"C"	PRZR Spray VLV Position Indicator
30	HS-5180F	"C"	STM Generator Blow Down Drains
31	43/1-456FT	"B"	Pressurizer PORV Trans Sw
32	1/1-456FL	"B"	Pressurizer PORV Control Sw
33	ZL-PCPX1F	"C"	RCP No. 1 Running Light
34	ZL-PCPX2F	"C"	RCP No. 2 Running Light

TABLE 1E (Continued)

<u>ITEM NO</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
35	ZL-PCPX3F	"C"	RCP No. 3 Running Light
36	ZL-PCPX4F	"C"	RCP No. 4 Running Light
37	MLB-63	"C"	(Monitor Light Box)
38	FI-4259B	"C"	SSW Pump 2 - Flow
39	PI-4253B	"C"	SSW Pump 2 - Discharge Pressure
40	V-1EA2-L	"B"	6.9 kV Bus 1EA2, Voltage
41	F-1EA2-L	"B"	6.9KV Bus 1EA2, Frequency
42	A-1EA2-2L	"B"	6.9KV Bus 1EA2, Alternate Offsite Source - Amperes
43	A-1EG2-L	"B"	6.9KV Bus 1EA2, Onsite Source-Amperes
44	A-1EA2-1L	"B"	6.9KV Bus 1EA2, Preferred Offsite Source-Amperes
45	CS-1EA2-2L	"B"	6.9KV Bus 1EA2, Alternate Offsite Source Breaker-Control Switch
46	CS-1EG2-L	"B"	6.9KV Bus 1EA2 Onsite Source Breaker-Control Switch
47	CS-1EA2-1L	"B"	6.9KV Bus 1EA2, Preferred Offsite Source Breaker-Control Switch
48	43-1EA2-2	"B"	6.9KV Bus 1EA2, Alternate Offsite Source Breaker-Selector Switch
49	43-1EG2	"B"	6.9KV Bus 1EA2, Onsite Source Breaker - Selector Switch
50	43-1EA2-1	"B"	6.9KV Bus 1EA2, Preferred Offsite Source Breaker - Selector Switch

TABLE 1E (Continued)

<u>ITEM NO</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
51	LI-503A	"C"	Steam Generator 3 - Level
52	LI-504A	"C"	Steam Generator 4 - Level
53	PI-534B	"C"	Steam Generator 3 - Pressure
54	PI-544B	"C"	Steam Generator 4 - Pressure
55	LI-460B	"C"	Pressurizer - Level
56	LI-2479B	"C"	Condensate Storage Tank - Level
57	HS-2451C	"B"	Motor-Driven AFW Pump 02 - Control Switch
58	HS-2451B	"B"	Motor-Driven AFW Pump 02 - Local/ Remote
59	1/1-APCH2L	"B"	Charging Pump 2 - Control
60	43/1-APCH2L	"B"	Charging Pump 2 - Local/Remote
61	NI-32F	"C"	Source Range - Neutron Pwr
62	HS-4251B	"B"	SSW Pump 2 - Local/Remote
63	ZL-2476B	"B"	Aux FW PMP Suction Pressure
64	ZL-2454C	"B"	Mot Drvn AFW PMP 02 Disch to SG 3 Contr VLV
65	ZL-2454D	"B"	Mot Drvn AFW PMP 02 Disch to SG 4 Contr VLV
66	ZL-2459B	"B"	Turb Dr AFW PMP Disch to SG 1 Contr VLV
67	ZL-2460B	"B"	Turb Dr AFW PMP Disch to SG 2 Contr VLV

TABLE 1E (Continued)

<u>ITEM NO</u>	<u>TAG NO.</u>	<u>TRAIN</u>	<u>FUNCTION/DESCRIPTION</u>
68	43/1-8153FT	"B"	RCS Excess Letdn. Trans Switch
69	1/1-8153FL	"B"	RCS Excess Letdn. Control Switch
70	HC-2325	"C"	Steam Generator 1-Porv
71	HC-2326	"C"	Steam Generator 2-Porv
72	HC-2327	"C"	Steam Generator 3-Porv
73	HC-2328	"C"	Steam Generator 4-Porv
74	HC-606	"C"	RHR Disch. Control Valve
75	HC-618	"C"	RHR Min. Flow Valve
76	HC-455C	"C"	PRZR Spray Valve

TABLE 2A

PROCEDURE TO BE FOLLOWED FOR FIRE AT HSP
(Only Train "A" Equipment Required)

OPERATOR'S WORK STATION	PROCEDURES
CR	1. Trip the Reactor & Turbine/Generator
CR	2. Start
CR	A. Diesel Gen. "A" & Auxiliaries
CR	A.1 CS/IDG 1E, CS/IDG IN, HS-3375A(F.O) Transfer Pump No. 1
CR	A.2 CCW PP No. 01 HS-4518A
CR	A.3 SW PP No. 01 HS-4250A
CR	A.4 Chilled Water Recirculation PP No. 01 HS-6700
CR	B. Charging PP No. APCH1 1/1-APCH1
CR	B.1 Boric Acid Transfer PP No. APBA1 1/1-APBA1
CR	C. Aux. Feedwater PP #01 HS-2450A
CR	D. Emergency Fan Room Coolers such as
CR	D.1 Diesel Generator "A" Room Fans HS-5691 A, B, C, D, & E
CR	D.2 Electrical Area Train "A" Emergency Fans El-810'-0" HS-5684B (SE-17) HS-5684A (SE-18)
CR	D.3 CCW Pump Emergency Fan HS-5800 (SE-09)
CR	D.4 Aux. Feedwater PP Emergency Fan HS-5676A (SE-07)

TABLE 2A (Continued)

WORK STATION	PROCEDURES
CR	D.5 Charging PP Emergency Fan HS-5802 (SE-03)
CR	D.6 RHR PP Emergency Fan (CSD) HS-5668A (SE-01)
CR	E. RHR PP #01 (Cold Shutdown) 1/1APRH1 Stop During HSB & HSD)
CR	A fire at the HSP will not spuriously mispo- tion Train "B" valves. Motor Operated Valves will fail "as is" and position indication will be lost since power supply is presumed not available. Process indication correspond- ing to valve "open" or "close" is shown on Table 2B.

TABLE 2B

VALVES REQUIRED FOR SHUTDOWN (HSP FIRE)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>CR INDICATION OR CONTROL</u>
1.	HV-2491B	"B"	AFW to STM GEN No. 1	Open	HS-2491
2.	HV-2492B	"B"	AFW to STM GEN No. 2	Open	HS-2492
3.	PV-2453A	"A"	Aux. Feedwater Press Control	Open	EK-2453A
4.	PV-2453B	"A"	Aux. Feedwater Press Control	Open	EK-2453B
5.	HV-4393	"A"	SW to Diesel GEN. "A"	Open	HS-4393
6.	1/1-8351A	"B"	Seal Inj. Inlet RCP No. 1	Open	FI-145*
7.	1/1-8351B	"B"	Seal Inj. Inlet RCP No. 2	Open	FI-144*
8.	1/1-8351C	"B"	Seal Inj. Inlet RCP No. 3	Open	FI-143
9.	1/1-8351D	"B"	Seal Inj. Inlet RCP No. 4	Open	FI-142
10.	1/1-8110	"A"	Charging PPS Min. Recir. Valve	Open	1/1-8110
11.	1/1-8111	"B"	Charging PPS Min REC RC. Valve	Open	None*
12.	1/1-8801A	"A"	Boron Inj. Isol. Valve	Close	1/1-8801A
13.	1/1-8801B	"B"	Boron Inj. Isol. Valve	Close	None*
14.	1/1-8104	"B"	Charging PPS Inlet Control Valve	Open	FI-183*
15.	1/1-8106	"A"	Charg PPS Disch to CVCS Isol. Valve	Close	1/1-8106
16.	FCV-110A	"C"	Charging PPS Inlet Valve	Close	1/1-FCV-110A

* Local Manipulation of Valve Required

TABLE 2B (Continued)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>CR INDICATION OR CONTROL</u>
17.	FCV-121	"C"	Pressurizer Level Control	Open	FK-121
18.	HV-4515	"B"	CCW Train "B" Isol. Valve	Close	None
19.	HV-4525	"B"	CCW Flow From Non Safe-Guards Loop	Open	FI-4536A, 4675-4677, 468 4689, 4683- 4685, 4679-4681
20.	HV-4527	"B"	CCW Flow to Non Safe-Guards Loop	Open	FI-4536A, 4675-4677, 468 4689, 4683- 4685, 4679-4681
21.	HV-4700	"B"	CCW Flow Inlet Header to RCP	Open	FI-4536A, 4675-4677, 468 4689, 4683- 4685, 4679-4681
22.	HV-4708	"B"	CCW Flow Return Header from RCP Coolers	Open	FI-4536A, 4675-4677, 468 4689, 4683- 4685, 4679-4681
23.	HV-4514	"A"	CCW Train "A" Isol. Valve	Open	HS-4514
24.	HV-4524	"A"	CCW Flow to Non Safeguard Loop	Open	HS-4524
25.	HV-4526	"A"	CCW Flow to Non Safeguard Loop	Open	HS-4526
26.	HV-4699	"A"	CCW Inlet Flow to RCP Coolers	Open	HS-4699

* Local Manipulation of Valve Required

TABLE 2B (Continued)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>CR INDICATION OR CONTROL</u>
27.	HV-4701	"A"	CCW Return Flow From RCP Coolers	Open	HS-4701
28.	HV-4286	"A"	SW Disch. Isol. Valve	Open	HS-4286
29.	1/1-8702A	"B"	RHR Suction Isol. Valve (HSD, HSB) Close (CSD) Open		None 1/1-8701A (TR"A" Close) None 1/1-8701A (TR"A" Open) or FI-618
30.	1/1-8702B	"B"	RHR Suction Isol. Valve (HSD, HSB) Close (CSD) Close		None 1/1-8701B (TR"A") None 1/1-8701B (TR"A" Close or FI-619)
31.	1/1-8701A	"A"	RHR Inlet Isol. Valve (HSD) Close (CSD) Open		1/1-8701A
32.	1/1-8701B	"A"	RHR Inlet Isol. Valve (HSD) Close (CSD) Close		1/1-8701B 1/1-8701B
33.	HCV-606	"C"	RHR Disch Control Valve	Open	HC-606
34.	FCV-618	"C"	RHR HX Bypass Flow	Close	FK-618
35.	FCV-610	"A"	RHR Min. Flow Valve	Close	1/1-FCV-610
36.	1/1-8809A	"A"	RHR Disch Isol. Valve (CSD) Open		1/1-8809A
37.	1/1-8716A	"A"	RHR Cross Connect	Close	1/1-8716A
38.	1/1-8812A	"A"	RHR Suction Cross Connect Valve	Close	1/1-8812A

* Local Manipulation of Valve Required

TABLE 2B (Continued)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>CR INDICATION OR CONTROL</u>
39.	1/1-8808A	"A"	SI Accumulator Tank Isolation Valve (CSD)	Close	1/1-8808A
40.	1/1-8808B	"B"	SI Accumulator Tank Isolation Valve (CSD)	Close	None-Manual By Jumpering @ MCC
41.	1/1-8808C	"A"	SI Accumulator Tank Isolation Valve (CSD)	Close	1/1-8808C
42.	1/1-8808D	"B"	SI Accumulator Tank Isolation Valve (CSD)	Close	None-Manual By Jumpering @ MCC
43.	PV-2325	"A"	SG No. 1 PORV	Close	PK-2325
44.	PV-2327	"A"	SG No. 3 PORV	Close	PK-2327
45.	PV-2326	"B"	SG No. 2 PORV	Close	PK-2326
46.	PV-2328	"B"	SG No. 4 PORV	Close	PK-2328
47.	PV-5180	"C"	SG Blowdown Drains	Close	PK-5180
48.	HV-4395	"A"	SW to Aux Feedwater PP	Close	HS-4395
49.	1/1-8149A	"A"	Letdown Isol. Valve	Close	1/1-8149A
50.	1/1-8149B	"A"	Letdown Isol. Valve	Close	1/1-8149B
51.	1/1-8149C	"A"	Letdown Isol. Valve	Close	1/1-8149C
52.	PCV-455A	"A"	Pressurizer PORV	Close	1/1-455A
53.	PCV-456	"B"	Pressurizer PORV	Close	1/1-456
54.	HV-2333A&B	"A"	Main Steam Isol. & Bypass Valve	Close	HS-2333A
55.	HV-2334A&B	"A"	Main Steam Isol. & Bypass Valve	Close	HS-2334A

* Local Manipulation of Valve Required

TABLE 2B (Continued)

	<u>VALVES</u>	<u>TRAIN</u>	<u>DESCRIPTION</u>	<u>REQUIRED POSITION</u>	<u>CR INDICATION OR CONTROL</u>
56.	HV-2335A&B	"A"	Main Steam Isol. & Bypass Valve	Close	HS-2335A
57.	HV-2336A&B	"A"	Main Steam Isol. & Bypass Valve	Close	HS-2336A
58.	HV-4512	"A"	CCW Isol. Valve	Open	HS-4512
59.	HV-4513	"B"	CCW Isol. Valve	Close	None*
60.	HV-8154	"B"	RCS Excess Letdown	Close	1/1-8154

* Local Manipulation of Valve Required

TABLE 3A

PROCEDURE TO BE FOLLOWED FOR FIRE AT STP
(Only Train "B" Equipment Required)

OPERATOR'S WORK STATION	PROCEDURES
CR	1. Trip the Reactor & Turbine/Generator
CR	2. Start
CR	A. Diesel Gen. "B" and Auxiliaries
	A.1 CS/1DG2E, CS/1DG2N, HS-3377A (F.O) Transfer Pump No. 1
CR	A.2 CCW PP No. 02 HS-4519A
CR	A.3 SW PP No. 02 HS-4251A
CR	A.4 Chilled Water Recirculation PP No. 6701 HS-6701
CR	B. Charging PP No. APCH2 1/1-APBA2 Boric Acid Transfer PP No. APBA2 1/1-APBA2
CR	C. Aux. Feedwater PP No. 02 HS-2451A
CR	D. Emergency Fan Room Coolers such as:
CR	D.1 Diesel Generator "B" Room Coolers HS-5695 A, B, C, D, & E
CR	D.2 Electrical Area Train "B" Emergency Fans El-852'-0" HS-5686A1(SE-16) HS-5686B1 (SE-15)
CR	D.3 CCW Pump Emergency Fan HS-5801 (SE-10)
CR	D.4 Aux. Feedwater PP Emergency Fan HS-5678A (SE-08)

TABLE 3A (Continued)

WORK STATION	PROCEDURES
CR	D.5 Charging PP Emergency Fan HS-5803 (SE-04)
CR	E. RHR PP No. 01 (Cold Shutdown) 1/1-APRH-2 (Stop during HSB and HSD)
CR	4. While the above equipment is started, other operators trip the power circuit breakers at the MCC for all Train "A" motor-operated valves in flow line of safe shutdown systems to preclude spurious signals from mispositioning these valves.
CR	5. Verify position of Train "A" valves using process indication available in the control room. See Table 3B.

TABLE 3B

VALVES REQUIRED FOR SHUTDOWN (STP FIRE)

	<u>Valves</u>	<u>Train</u>	<u>Description</u>	<u>Required Position</u>	<u>CR Indication & Controls</u>
1.	HV-2493-A	"A"	AFW to Steam Gen No. 3	Open	HS-2493-A
2.	HV-2494-A	"A"	AFW to Steam Gen No. 4	Open	HS-2494-A
3.	PV-2454A	"B"	Aux Feedwater Press Control SG No. 3	Open	FK-2454A
4.	PV-2454B	"B"	Aux. Feedwater Press Control	Open	FK-2453
5.	HV-4394	"B"	Sw Diesel Gen. "B"	Open	HS-4394
6.	1/1-8351A	"B"	Seal Inj. Inlet RCP No. 1	Open	1/1-8351A
7.	1/1-8351B	"B"	Seal Inj. Inlet RCP No. 2	Open	1/1-8351B
8.	1/1-8351C	"B"	Seal Inj. Inlet RCP No. 3	Open	1/1-8351C
9.	1/1-8351D	"B"	Seal Inj. Inlet RCP No. 4	Open	1/1-8351D
10.	1/1-8110	"A"	Charge PPS Min. Recirc. Valves	Open	None*
11.	1/1-8111	"B"	Charging PPS Min. Recirc. Valve	Open	1/1-8111
12.	1/1-8801A	"A"	Boron Inj. Isol. Valve	Close	None*
13.	1/1-8801B	"B"	Boron Inj. Isol. Valve	Close	1/1-8801B

* Local manipulation of valve required.

Table 3B (Continued)

<u>Valves</u>	<u>Train</u>	<u>Description</u>	<u>Required Position</u>	<u>CR Indication & Controls</u>
14. 1/1-8104	"B"	Charging PPS Inlet Control Valve	Open	1/1-8104
15. 1/1-8105	"B"	Charg PPS Disch to CVCS Isol. Valve	Close	1/1-8105
16. FCV-110A	"C"	Charging PPS Inlet Valve	Close	1/1FCV-110A
17. FCV-121	"A"	Pressurizer Level Control	Open	None (Open ICS-8387B)
18. HV-4515	"B"	CCW Train "B" Isol. Valve	Close	HS-4515 (8387B)
19. HV-4525	"B"	CCW Flow from Non-Safeguard Loop	Open	FI-4536A, 4675-4677, 4687-4689, 4683- 4685, 4679-4681 or HS4525
20. HV-4527	"B"	CCW Flow to Non-Safeguard Loop	Open	FI-4536A, 4675-4677, 4687- 4689, 4683-4685, 4679-4681 or HS4527
21. HV-4700	"B"	CCW Flow Inlet Header to RCP	Open	FI-4536A, 4675-4677, 4687- 4689, 4683-4685, 4679-4681 or HS4700
22. HV-4708	"B"	CCW Flow Return Header from RCF Coolers	Open	FI-4536A, 4675-4677, 4687- 4689, 4683-4685, 4679-4681 or HS4708
23. HV-4514	"A"	SW to Diesel Gen. "A"	Open	None*
24. HV-4524	"A"	CCW Flow to Non Safe Loop	Open	None*

* Local manipulation of valve required.

Table 3B (Continued)

<u>Valves</u>	<u>Train</u>	<u>Description</u>	<u>Required Position</u>	<u>CR Indication & Controls</u>
25. HV-4526	"A"	CCW Flow to Non-Safe Loop	Open	None*
26. HV-4699	"A"	CCW Inlet Flow to RCP Coolers	Open	None*
27. HV-4701	"A"	CCW Return Flow From RCP Coolers	Open	None*
28. HV-4287	"B"	SW Disch. Isol. Valve	Open	HS-4287
29. 1/1-8702A	"B"	RHR Suction Isol. Valve (HSD, HSB) (CSD)	Close Close	1/1-8702A (TR"B") 1/1-8702A
30. 1/1-8702B	"B"	RHR Suction Isol. (HSD, HSB) (CSD)	Close Open	1/1-8702B 1/1-8702B
31. 1/1-8701A	"A"	RHR Inlet Isol. (HSD) Valve (CSD)	Close Close	None-1/1-8702A (TR"B") None-1/1-8702A (TR"B")
32. 1/1-8701B	"A"	RHR Inlet Isol. (HSD) Valve (CSD)	Close Open	None 1/1-8702B (TR.B) None*
33. HCV-607	"C"	RHR Disch Control Valve	Open	HC-607
34. FCV-619	"C"	RHR HX Bypass Flow	Close	FK-619
35. FCV-611	"B"	RHR Min. Flow Valve	Close	1/1-FCV-611
36. 1/1-8809B	"B"	RHR Disch Iso. (CSD) Valve	Open	1/1-8809B
37. 1/1-8716B	"B"	RHR Cross Connect	Close	1/1-8716B
38. 1/1-8812A	"A"	RHR Suction Cross-connect	Close	1/1-8812A

* Local manipulation of valve required.

Table 3B (Continued)

<u>Valves</u>	<u>Train</u>	<u>Description</u>	<u>Required Position</u>	<u>CR Indication & Controls</u>
39. 1/1-8808A	"A"	SI Accumulator (CSD) Tank Isolation Valve	Close	None-Manual By Jumpering @ MCC
40. 1/1-8808B	"B"	SI Accumulator (CSD) Tank Isolation Valve	Close	1/1-8808B
41. 1/1-8808C	"A"	SI Accumulator (CSD) Tank Isolation Valve	Close	None-Manual By Jumpering @ MCC
42. 1/1-8808D	"B"	SI Accumulator (CSD) Tank Isolation Valve	Close	1/1-8808D
43. PV-2325	"A"	SG No. 1 PORV	Close	PK-2325
44. PV-2327	"A"	SG No. 3 PORV	Close	PK-2327
45. PV-2326	"B"	SG No. 2 PORV	Close	PK-2326
46. PV-2328	"B"	SG No. 4 PORV	Close	PK-2328
47. PV-5180	"C"	SG Blowdown Drains	Close	PK-5180
48. HV-4396	"B"	SW to Aux Feedwater PP	Close	HS-4396
49. 1/1-8152	"B"	Letdown Isol Valve	Close	1/1-8152
50. PCV-455A	"A"	Pressurizer PORV	Close	1/1-455A
51. PCV-456	"B"	Pressurizer PORV	Close	1/1-456
52. HV-2333A&B		Main Steam Isol & Bypass Valves	Close	HS-2333A (Two Train SW)
53. HV-2334A&B	"B"	Main Steam Isol. & Bypass Valve	Close	HS-2334A
54. HV-2335A&B	"B"	Main Steam Isol. & Bypass Valve	Close	HS-2335A
55. HV-2336A&B	"B"	Main Steam Isol. & Bypass Valve	Close	HS-2336A
56. HV-4512	"A"	CCW Isol. Valve	Close	None*

* Local manipulation of valve required.

Table 3B (Continued)

<u>Valves</u>	<u>Train</u>	<u>Description</u>	<u>Required Position</u>	<u>CR Indication & Controls</u>
57. HV-4513	"B"	CCW Isol. Valve	Open	HS-4513
58. 1/1-8154	"B"	RCS Excess Letdown	Close	1/1-8154

TABLE 4

HIGH PRESSURE/LOW PRESSURE INTERFACES

<u>Item</u>	<u>H.P.</u>	<u>L.P.</u>	<u>Valves In Flowpath</u>
Pressurizer Relief (PORVs)	2235	3	1PCV-455A, 1PCV-456
RCS Letdown to Regen. HX	2200	510	1 LCV-459, 1-8149 A,B,C
RCS Excess Letdown thru Excess Letdown HX to RCDT	2200	40	1-8154, 1-8153, 1HCV-123
RCS to RHR	2235	400	1-8701A,B; 1-8702 A,B

TABLE 5

ALTERNATE SHUTDOWN ANNUNCIATORS

<u>TAG NO.</u>	<u>DESCRIPTION</u>	<u>ANN. BOX/POINT</u>
ZA-8701AF	RHR Loop 1 Isol. Valve	ALB-4B/3.5
ZA-8701BF	RHR Loop 2 Isol. Valve	ALB-4B/4.5
ZA-STP-1	Shutdown Transfer Panel Door Open	ALB-6C/4.1
ZA-STP-2	Shutdown Transfer Panel Local Override	ALB-6C/4.2
ZA-HSP-A	Hot Shutdown Panel Local Override	ALB-6C/4.3
ZA-HSP-DAB	Hot Shutdown Panel Door Open	ALB-6C/4.4
ZA-5691	Diesel Generator Fans Local Override	ALB-11B/3.18

TABLE 6

JUNCTION BOXES AND LOCATIONS

The following valves are equipped with Junction Boxes for manually disconnecting CR Circuitry and Connect Local Control at the HSP.

VALVES	JUNCTION BOX/LOCATION	X	Y	Z
PV-2325, 2327	JB IS 1053Ø/Safeguard Bldg.	859	4903	4852
	JB IS 1277/Safeguard Bldg.	856	4903	4852
	JB IS 1238/Safeguard Bldg.	837	4923	4780
PV-2326, 2328	JB IS 1051G/Safeguard Bldg.	859	4883	4896
	JB IS 1276/Safeguard Bldg.	856	4883	489C
	JB IS 1237/Safeguard Bldg.	837	4923	4776
FCV-618 PCV-455C HCV-606	JB IS 942/Safeguard	857	4923	4778

DETAILED ANALYSIS OF SHUTDOWN LOGIC
SKETCH (XB-2323-1800)

Sketch XB-2323-1800, Attachment No. 1, Sheets 1 through 15, defines the logic paths required to achieve hot standby, hot shutdown and cold shutdown for CPSES Unit 1 or 2. The downstream side of a control condition symbol is marked with a small x to show the required logic paths. Adjacent to the control condition are boxed revision numbers which correspond to the paragraph numbers in the column titled "Revisions" in the boxed section beginning with paragraph 4.1.1.

Tabulated below are the vital components and safe shutdown systems that are lost in a postulated design basis CR fire as shown by cross-hatched areas on the shutdown logic sketches. Paragraphs listed under "Section" discuss revisions required to regain control of circuits lost.

SYSTEMS & EQUIPMENT REQUIRED FOR HOT STANDBY (HSB)

<u>System</u>	<u>Shutdown Logic Sketch</u>	<u>Section</u>
Reactor Trip	XB-2323-1800. Sh. 4	4.1.1
Steam Gen. Press Control	XB-2323-1800. Sh. 10	4.1.2
Steam Gen. Inventory Control	XB-2323-1800. Sh. 9A	4.1.3
RCP Seal & Cooling Integrity	XB-2323-1800. Sh. 8	4.1.4
RCS Inventory Control	XB-2323-1800. Sh. 6	4.1.5
RCP Tripped	XB-2323-1800. Sh. 1	4.1.6
RCS Press Control	XB-2323-1800. Sh. 5	4.1.7
RCP's Running	XB-2323-1800. Sh. 1	4.1.8

SYSTEMS & EQUIPMENT REQUIRED FOR HOT SHUTDOWN (HSD)

<u>System</u>	<u>Shutdown Logic Sketch</u>	<u>Section</u>
SG Inventory Control	XB-2323-1800. Sh. 9A	4.2.1
Reactivity Control	XB-2323-1800. Sh. 7	4.2.2
RCS Press Control	XB-2323-1800. Sh. 5	4.2.3
RCS Inventory Control	XB-2323-1800. Sh. 6	4.2.4
RCS Seal Integrity	XB-2323-1800. Sh. 8	4.2.5
SG Press Control	XB-2323-1800. Sh. 10	4.2.6

SYSTEMS & EQUIPMENT REQUIRED FOR COLD SHUTDOWN (CSD)

<u>System</u>	<u>Shutdown Logic Sketch</u>	<u>Section</u>
Misc. Control Systems	XB-2323-1800 Sh. 3A & 3B	4.3
Component Cooling Water System	XB-2323-1800 Sh. 11A & B	4.4
Service Water System	XB-2323-1800 Sh. 13A	4.5
Chilled Water System	XB-2323-1800 Sh. 13	4.6
Diesel Gen. Aux.	XB-2323-1800 Sh. 14	4.7
AC Power Availability	XB-2323-1800 Sh. 15A 15B 15C	4.8

4.1 HOT STANDBY (HSB) ANALYSIS

4.1.1 Reactor Trip (XB-2323-1800, Sh. 4)

Flow Diagram and ICD	Channel No.	Revisions	Case/Train**
-------------------------	----------------	-----------	--------------

- 1.*Local operation at the switchgear.

In this analysis, it is assumed that if a design basis fire occurs in the CR, CSR or HSP the operator trips the reactor at the CR or locally at the switchgear.

4.1.2 Steam Generator Pressure Control (XB-2323-1800 Sh. 10)

2323-M1-0202 514F
8758D39 524F
Sh 13

1. Add new press transmitters at steam generators 1 and 2

1
"C"

2323-M1-0202 2325
2323-M1-2202-01 2326
2327
2328

2. These valves are affected by a CSR or CR fire. To prevent spurious signal opening these valves, following junction boxes provided with switches to disconnect control room controllers and connect local controllers at the HSP See Table 1E & 6

Valves

PV-2325 "A"
PV-2327

PV-2326 "B"
PV-2328

2323-M1-0202
2323-M1-2202-02
2323-M1-2202-10

2324
2334
2335
2336

3. Provide SE1-Switch for
each set of main &
bypass isolation valves
at the STP and control
switch at the HSP.

3
"A"

* These numbers correspond to boxed numbers on logic diagrams,
Attachment 1.

** See Attachments 2 to 7. Number: Case; Letter: Train

4.1.3 Steam Generator Inventory Control (XB-2323-1800
Sh. 9A)

Flow Diagram and ICD	Channel No.	Revisions	Case/Train**
2323-MI-0206 2323-MI-2206-01	2450	1. Move HS-2450 B from the HSP to STP	4 "A"
2323-MI-0206 2323-MI-2206-03	2453	2. PT-2453 required to avoid pump runout cau- sed by depressurized SG; required steam line/feed line break. Protection against steam/feedline breaks not considered for alternate shutdown. HSP loading station for AFW flow made indepen- dent of control room power supplies.	"A"
2323-MI-0206 2323-MI-2206-03	2456	3. For valve FV 2456 pro- vided a sel. switch at STP and local control switch at HSP.	3 "A"
2323-MI-0202 W 8758D39 Sh 34	501 502	4. Provide additional wide-range level trans- mitter at steam genera- tors.	1 "C"
2323-MI-0206 2323-MI-2206-07	2478	5. Local level indicator LI-2479 available at storage tank. New level transmitter added to in- dicate at HSP using exist- ing indicator. Preferable to using existing local indicator.	1 "C"
2323-MI-0239 2323-MI-2239-01	5180	6. Provide PV-5180 on Steam Generator Blowdowns Sys- tem with control switch and solenoid valve.	"C"
2323-MI-0206 2323-MI-2206-10	2491 2492	7. These Train "B" valves covered by Case 3.	3 "B"

4.1.3 (Continued)

Flow Diagram and ICD	Channel No.	Revisions	Case/Train**
2323-M1-0302 2323-M1-2302-06	5676	8. Existing local fan cooler control modified to be independent of CR circuitry. Selector and control switches located locally at the Mfr. -supplied control panel.	"A"

4.1.4 Reactor Coolant Pump Seal Integrity (XB-2323-1800
Sh. 8)

Flow Diagram and ICD	Channel No.	Revisions	Case/Train**
		The RCP seal integrity met by use of B.A. transfer PP, centrifugal charging PP and valve line up in the flow path.	
2323-M1-0253 2323-M1-2253-16	8351A "B" "C" D	1. A. RCP seal inlet isolation valves 1/8351 A,B,C. & D are Train "B" valves covered by Case 3.	3 "B"
2323-M1-2253-03	145 144 143 142	B. Indicators located in CR, can be used during STP or HSP fire to indicate closed RCP seal inlet isolation valves. Edge wise flow meters also provided locally.	"C"
2323-M1-0250 2323-M1-2250-05 2323-M1-0251 2323-M1-2251-03A	PCPX1 PCPX2 PCPX3 PCPX4 PCV-455B PCV-455C	C. RCP & Spray valves provided with running and position indication lights at HSP. If pumps are running and corresponding spray valves are open, the RCPs are tripped at the switchgear.	"C"

4.1.5 RCS Inventory Control (XB-2323-1800, Sh. 6)

Flow Diagram and ICD	Channel No.	Revisions	Case/Train**
2323-M1-0251 2323-M1-2251-04	459F	1. Add new level trans- mitter at the pressur- izer (459F)	1 "C"
2323-M1-0253 2323-M1-2253-13	8149A 8149B 8149C	2. For valves 8149A, thru C, move Sel. switch from HSP to STP.	4 "A"
2323-M1-0261 2323-M1-2261-01	8801A 8801B	3. For valves 8801A and 8801B, see Case No. 3	3 "A"
2323-M1-0255 2323-M1-2255-01	APCH1L	4. Move Sel. SW 43/1 APCH1L from the HSP to STP.	4 "A"
2323-M1-0255 2323-M1-2255-12	121	5. Add Sel. SW. at STP for Local/Remote Con- trol. ICS 8387A manual valve can be used during STP Fire if FCV 121 closed.	2a "C"
2323-M1-0303 2323-M1-2303-06	5802	6. Existing local fan cooler control modi- fied to be independent of CR circuitry.	
2323-M1-0255 2323-M1-2255-18	8106	7. For valve 8106 (Tr"A") added Sel. switch at the STP, and control switch at the HSP	3 "A"
2323-M1-0255 2323-M1-2255-19	8110 8111	8. For 8110 (Train "A") added Sel. switch at the STP and a local control switch at the HSP For 8111 (Train "B") add a monitor light at the HSP (Open Position)	3 "A" "B"
2323-M1-0253 2323-M1-2253-14	8153	9. Add selector & con- trol switch at the HSP	3 "B"

4.1.6 Reactor Coolant Pump Tripped (XB-2323-1800, Sh. 1)

Flow Diagram	Channel	Revisions	Case/Train
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In the event of CR or CSR fire, offsite power may not be lost. RCPs are powered from offsite source and, if available, hot standby forced cooling is possible. However, a fire in these locations could result in loss of all protective relaying associated with the RCP and auxiliary systems needed to keep the RCPs running. Hot standby natural circulation introduces simplifications of control design as concluded in discussion with Westinghouse. Depending on the severity of the accident, the operator has option to select either forced or natural circulation. The design was revised to have:

- A. RCP running light at the HSP
- B. Ammeter at the switchgear (for local operation)

4.1.7 Reactor Coolant System Press. Control (XB-2323-1800, Sheet 5)

Flow Diagram and ICD	Channel No.	Revisions	Case/Train
----------------------	-------------	-----------	------------

- | | | | |
|----------------------------------|--------|---|---|
| 2323-M1-0251
8758 D 39 Sh. 12 | 455F | 1. Add 1 wide range (0-3000 psig) pressure transmitter at the pressurizer and use existing pressure indicator 455 at the HSP. This covers HSB, HSD to CSD RCS pressure. | 1 |
| 2323-M1-0251
7247D05 Sh. 12 | PCPR1L | 2. Move selector switch of group A heaters 43/1-PCPR1L from the HSP to STP. | 4 |

2323-M1-0251	456	3. To avoid LOCA caused by	3
2323-M1-2251-03	455A	spurious closing & opening	"A"
		of PORV's (456 & 455A)	
		during a CR Fire, PORV	
		PCV 455A is provided with	
		a Sel. SW at STP and a	
		control switch at HSP.	
		For valve PCV-456 same	"B"
		with PCV 455A except that	
		Sel. & control switches	
		are located at HSP.	

4.1.8 Reactor Coolant Pump Running (XB-2323-1800, Sh. 1)

Refer to 4.1.6.

4.2 Hot Shutdown (HSD) Analysis

4.2.1 Steam Gen. Inventory Control (XB-2323-1800, Sh. 9A)

Same as 4.1.3.

4.2.2 Reactivity Control (XB-2323-1800, Sh. 7)

4.2.3 RCS Pressure
Control (XB-2323-1800 Sh. 5)

Same as 4.1.7

4.2.4 RCS Inventory
Control (XB-2323-1800 Sh. 6)

Same as 4.1.5

4.2.5 RCS Seal
Integrity(XB-2323-1800 Sh. 8)

Same as 4.1.4

4.2.6 SG Pressure
Control (XB-2323-1800 Sh. 10)

Same as 4.1.2

Flow Diagram and ICD	Channel No.	Revisions	Case/Train
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2323-M1-0255	8104	1. Motor operated valve	3
2323-M1-2255-16		1/1-8104 is powered from	"B"
		Train "B" bus. This valve	
		using the handwheel. Indi-	
		cating light added at HSP.	
2323-M1-0255	110	2. To block flow path via	"C"
2323-M1-2255-03	(8444)	FCV-110A, if power is lost	
		and instrument air is not	
		available, close manual	
		valve ICS-8444.	
2323-M1-0257	APBAIL	3. For boric acid transfer	4
2323-M1-2257-01		pump Train "A" only, relo-	"A"
		cate selector switch from	
		HSP to STP.	

Flow Diagram and ICD	Channel No.	Revisions	Case/Train
2323-M1-0251 7247D05 Sh. 12	PCPRIL	1. Pressurizer pressure control: same as Revision No. 2 of Section 4.1.7. Remaining heater groups disabled via switchgear local operation.	
2323-M1-0250 2323-M1-2250-03	413F 424F 433F 443F	2. Provided new strap-on RTD's on RCS hot legs and 2 2-Pen recorders at HSP.	
2323-M1-0255 2323-M1-2255-12	121	3. Covered by 4.1.5.	
2323-M1-0262 2323-M1-2262-04	8808A 8808C 8808B 8808D	4. During HSB & HSD, these valves may be closed or open. However, when the RCS reaches 1,000 psig the valves should be closed. The MCC are provided with jumpering capability. Indicating lights are also provided at the MCC.	"A" "B"
2323-M1-0202 2323-M1-2202-01	2325 2327 2326 2328	5. To avoid spurious signal junction boxes JB #IS 1053] (Train "A") & 1 -0151 G (Train "B") are provided with switches to close these valves.	"A" "B"
2323-M1-0251 2323-M1-2251-04	455F	6. To cover the entire pressure range of the RCS, a wide-range pressure transmitter (0-3000 psig) added with indicator at HSP.	1 "C"

2323-M1-0251 2323-M1-2251-03	455A	7. To prevent at LOCA these PORV's are closed, Train "A" valve is provided with a transfer switch at STP and control switch at HSP. For Train "B" similar to Train "A" except selector and control switches are located at HSP.	"A"
	456		"B"
2323-M1-0251 2323-M1-2251-04	455F	8. For CSD, PI455B is used at HSP	1 "C"
2323-M1-0260 2323-M1-2260-01	APRH1	9. Revise control wiring of RHR pumps to add Sel. Sw at the STP for local/remote operation and control switch at HSP for Train "A" pump.	3 "A"
2323-M1-0260 2323-M1-2260-05	8701A 8701B	10A. For valve 8701 A&B provide a SEL. switch at STP and a keylocked control switch at HSP. Isolate the two lines during HSB & HSD to prevent LOCA.	3 "A"
2323-M1-2260-05	8702A	10B. For valve 8702A, valve is manually open via hand-wheel at start of CSD. Sufficient time is available for manual operation before CSD.	
2323-M1-0260 2323-M1-2260-02	606	11A. HCV-606 valve is normally open and fails open. Valve can be manually opened VIA JB #IS-942 (previously added to address cold shutdown from outside the control room). No design changes required.	

2323-M1-0260 2323-M1-2260-04	618	11B. Same as 11A	"C"
2323-M1-0263 2323-M1-2263-06	8812A	11C. RWST to RHR suction valve (8812A&B) be disconnected at the MCC and manually closed prior to RHR operation. No modifications, except procedural.	"A"
2323-M1-0263 2323-M1-2263-06	8811A	11D. During cold shutdown, this valve must be closed to prevent reactor coolant from flowing to the containment sump. The MCC is provided with jumpering capability. Indicating light is provided at the MCC.	
2323-M1-0263 2323-M1-2263-06	8809A	12. 8809A, same as (11C) above	"A"
2323-M1-0263 2323-M1-2263-06	610	13. Valve FCV-610 RHR Mini flow; no changes needed as HCV-606 can be opened.	"A"
2323-M1-0260 2323-M1-2260-05	8716A	14. Valve 8716A to be manually closed by disconnecting power at MCC & manipulating handwheel.	

4.4

COMPONENT COOLING WATER ANALYSIS (XB-2323-1800,
SH.-11A AND 11B)

Flow Diagram and ICD	Channel No.	Revisions	Case/Train
2323-M1-0229 2323-M1-2229-03	4518	1. Relocate selector switch of pump No. 1 from HSP to STP	4
2323-M1-0303 2323-M1-2303-06	5800	2. Modify control circuitry to have two sets of fuses in CR & at Local control.	
2323-M1-0229 2323-M1-2229-02 2323-M1-2229-04	4525 4527 4515	3A. For HV-4525, HV-4527, and HV-4515. Provide valve position light at HSP. Trip valve power at MCC. Any valves out of alignment would be manually operated via handwheel.	3 "B"
	4524 4526 4514	3B. For valves 4524, 4526 & 4514 add Sel. switches at STP and control switches at the HSP.	3 "A"
2323-M1-0231 2323-M1-2231-03	4699 4701 4700	3. For HV-4699 & HV-4701 similar to 3B above. For HV-4700 & HV-4708	3 "A"
2323-M1-2231-05	4708	similar to 3A above.	3 "B"
2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01 2323-M1-2231-01	4675 4676 4677 4679 4680 4681 4683 4684 4685 4687 4688 4689	4. No change. These process indicators used during STP or HSP Fire. They substitute for valve-position indication.	

4.5 SERVICE WATER SYSTEM ANALYSIS (XB-2323-1800, SH. 12A)

Flow Diagram and ICD	Channel No.	Revisions	Case/Train
2323-M1-0233 2323-M1-2233-01	4250	1. Service water pump No. 1: move switch HS4250B from HSP to STP	4 "A"
2323-M1-0233 2323-M1-2233-05	4286	2. Service water pump No. 1 discharge isolation valve HV-4286: provide a selec- tor switch at STP and local control switch at HSP.	4 "A"
2323-M1-0234 2323-M1-2234-02	4393	3. Same as 2 above	4 "A"
2323-M1-0234 2323-M1-2234-02	4395	4. Valve HV-4395: use hand- wheel operation only. No design changes required.	

4.6 CHILLED WATER SYSTEM ANALYSIS (XB-2323-1800, SH. 13)

2323-M1-0311 2323-M1-2311-01	6700	1. Chilled water recircula- tion pump #05; provide selector switch at STP and control switch at HSP	3 "A"
2323-M1-0311 2323-M1-2311-01	HS-XT	2. A fire at the CR affects the automatic start-up of the water chiller control.	
2323-M1-0302 2323-M1-2302-08	5684B1 5684A1	3. Modify control circuitry to provide two sets of fuses: in CR & at Local control.	

4.7 DIESEL GENERATOR AND AUXILIARIES ANALYSIS (XB-2323-1800, SH. 14)

2323-M1-0302 2323-M1-2302-10	5691A 5691B 5691C 5691E 5691D	1. Room ventilation fans protected in case of CR fire. Local selector & control switches provided.	
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4.8

AC POWER AVAILABILITY (XB-2323-1800, SH. 15A, B, & C)

For Diesel Generator and On-Site Standby Power System, Train "A" transfer switches, located on Hot Shutdown Panel, were relocated to STP. Modifications, including separately fused circuits to the equipment, were provided to isolate effects of postulated fire.

See Table 1B for STP details. See Table 1D for HSP details.

5.0

CONCLUSION

The design and procedural modifications called for by this study, when implemented, will permit CPSES to meet the intent of BTP APCSB 9.5-1 for alternate shutdown capability despite a crippling 1) control room, 2) cable spreading room, 3) STP or 4) HSP fire.

6.0

LIST OF ABBREVIATIONS

CSR	Cable Spreading Room
CR	Control Room
HSP	Hot Shutdown Panel
STP	Shutdown Transfer Panel
HSB	Hot Standby
HSD	Hot Shutdown
CSD	Cold Shutdown
CCW	Component Cooling Water
SSW	Service Water
VLV	Valve
SG	Steam Generator
RCS	Reactor Coolant System
RHR	Residual Heat Removal
PP	Pump
PPs	Pumps
FW	Feedwater

REFERENCES

1. TGH-5820, September 21, 1979
2. TCP-411, 1/21/80, Office Memo from J.C. Kuykendall to H.C. Schmidt
3. Office Memo from H.C. Schmidt to J.T. Merritt, 5/23/80
Attachment: Minutes of Meeting with NRC
4. NRC Docket Nos. 50-445 and 50-446, 6/9/80
5. CPPA-3353, 6/13/80, Office Memo from B.J. Murray to J.C. Kuykendall
6. CPP-3381, Office Memo from Wayne Varnell to J.T. Merritt
7. CPP-3416, 6/27/80, Office Memo from D.E. Freeman to Warren Chapman
8. Memorandum from DJC to HRR, 7/2/80
9. WPT-3654, 8/8/80
10. GTN-48361, 8/15/80
11. CPPA-6097, 8/15/80, Office Memo from J.T. Merritt to H.C. Schmidt
12. GTN-48802, 9/10/80
13. GTN-48840, 9/12/80
14. GTN-49003, 9/19/80
15. GTT-7220, 9/29/80
16. Office Memo from R.A. Jones to J.T. Merritt, 9/30/80
17. Office Memo from J.S. Marshall to R. Estes, 9/30/80
18. Office Memo from J.S. Marshall to R.L. Estes, Log No. 2810, 9/30/80
19. WPT-3758, 10/1/80
20. GTN-49253, 10/1/80
21. GTN-52615, 4/6/81

- 22. GTN-52459, 3/27/81
- 23. GTN-52229, 3/17/81
- 24. CPPA-9392, 4/6/81
- 25. CPPA-11954, 8/18/81

SHUTDOWN LOGIC DIAGRAMS

ATTACHMENT 1

1.0 DEFINITION

GRAPHIC REPRESENTATION OF PROCEDURE REQUIRED TO ACHIEVE SPECIFIC OBJECTIVE.

2.0 REACTOR OPERATIONAL MODES

OPERATIONAL MODE	REACTIVITY CONDITION, K _{EFF}	% RATED THERMAL POWER (EXCLUDING DECAY HEAT)	AVERAGE COOLANT TEMPERATURE
HOT STANDBY	<0.99	0	≥ 350° F
HOT SHUTDOWN	<0.99	0	200° F < T _{AVG} < 350° F
COLD SHUTDOWN	<0.99	0	≤ 200° F

3.0 SYMBOLS


3.1  PROCESS INFORMATION AND/OR OPERATOR ACTION


3.2  CONTROL CONDITION


3.3  TERMINAL POINT (SPECIFIC OBJECTIVE)

3.4  OFF PAGE CONNECTOR

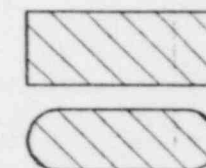
DECISION LOGIC

3.5  LOGIC OUTPUT "X" EXIST IF AND ONLY IF ONE OR MORE LOGIC INPUTS A,B,C EXIST.

3.6  LOGIC OUTPUT "X" EXIST IF AND ONLY IF ALL LOGIC INPUTS A,B,C EXIST.

3.7  NOT

3.7 X-DESIRED LOGIC PATH



EQUIPMENT DESTROYED BY A CA, CSA, OR A MSP FIRE

										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
										 <small>ENGINEERING, DESIGN, CONSTRUCTION NEW YORK</small>		SHUTDOWN LOGIC DIAGRAMS		SKETCH NO. XB-2323-1800	
FIRE PROTECTION ANALYSIS														SHEET NO. 0 OF 15	
ISSUE NO.	DATE	OWN.	CHRD.	SOUND LDR	14C	MECH	NUCLEAR	ELEC	P.E.	ISSUED FOR					
A	WED														

JOB NO. 11-2323-025

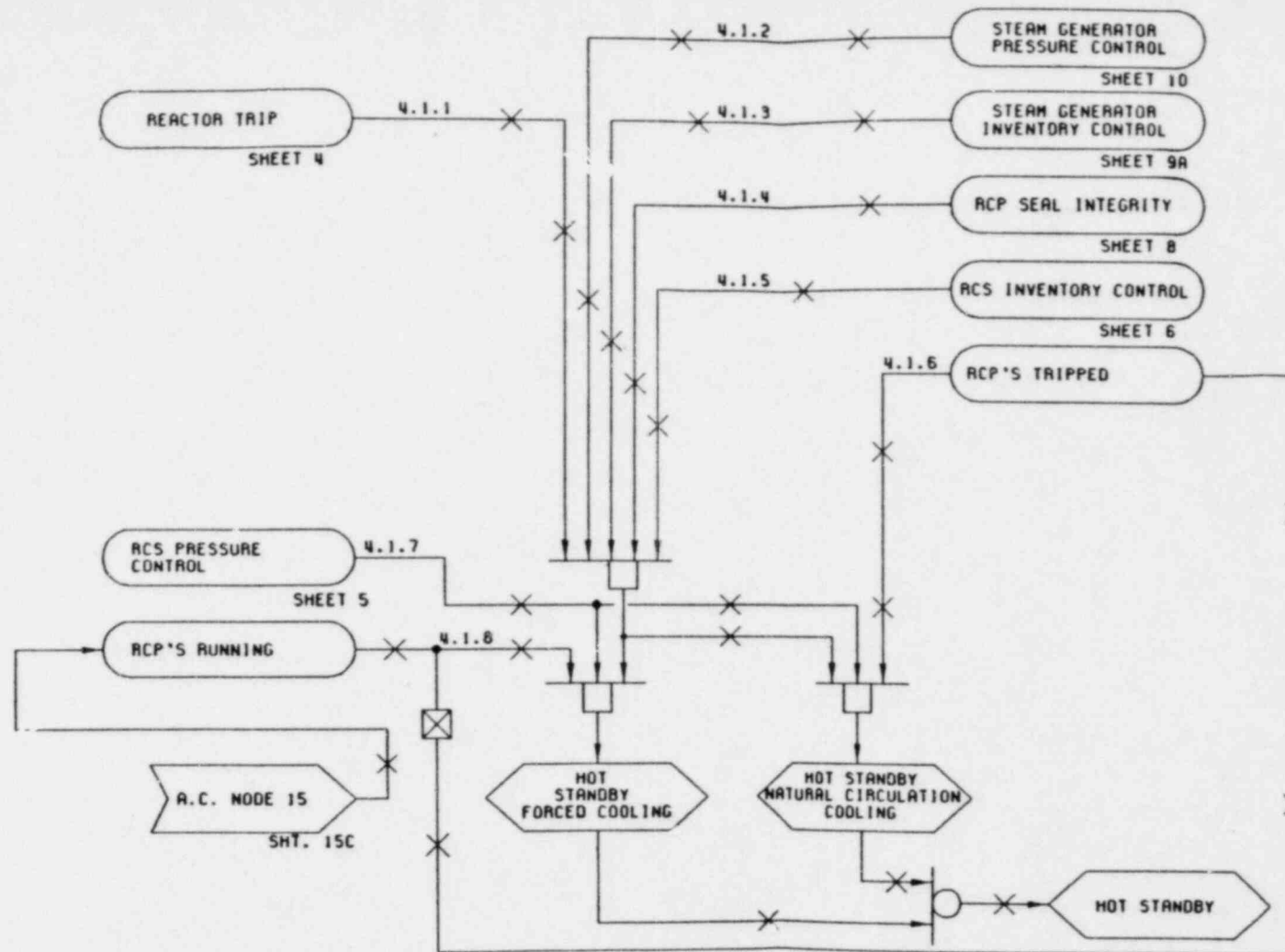
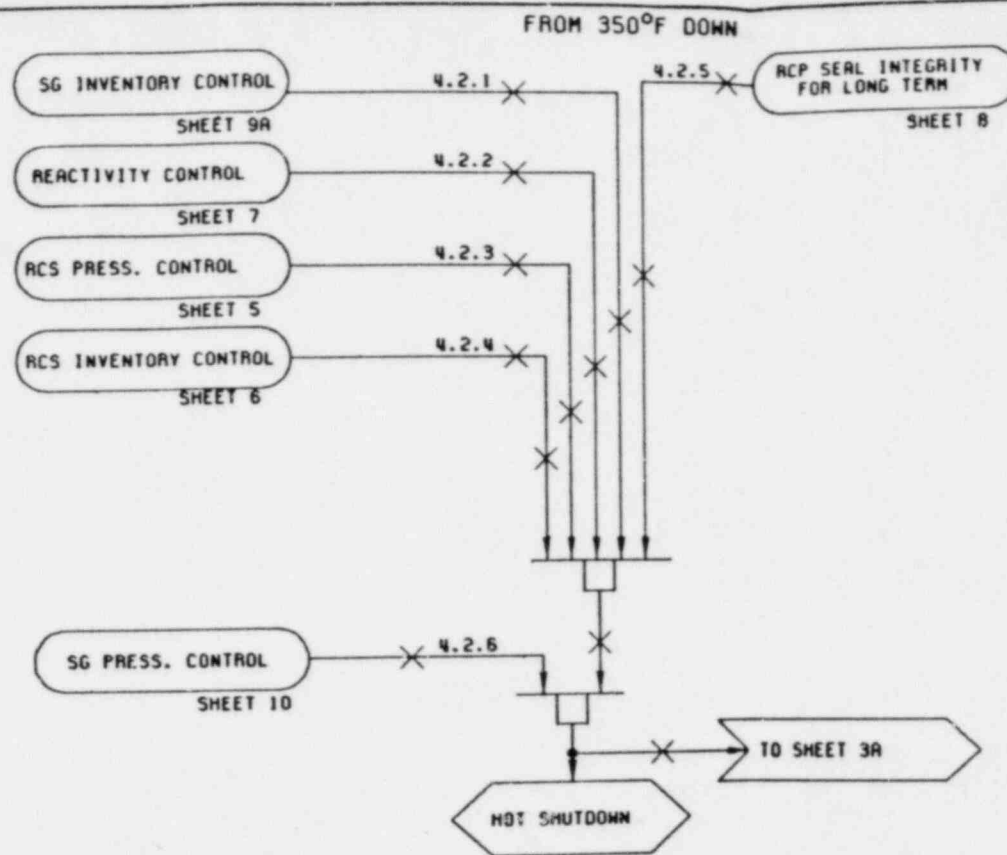


ABB.

MSB-HOT STANDBY
MSD-HOT SHUTDOWN
CSD-COLD SHUTDOWN
CA-CONTROL ROOM
REM/MAN-REMOTE/MANUAL
CB-CONTROL BOARD
HSP-HOT SHUTDOWN PANEL
SWGR-SWITCHGEAR

										CORANQUE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
												SKETCH NO. XB-2323-1800 SHEET NO. 1 OF 15			
FIRE PROTECTION ANALYSIS										ISSUED FOR		SHUTDOWN LOGIC DIAGRAMS			
ISSUE NO.	DATE	OWN.	CHKD.	SQUAD LDR	IAC	MECH	NUCLEAR	ELEC	P.E.						
A	WED														

JOB NO. 11-2323-025



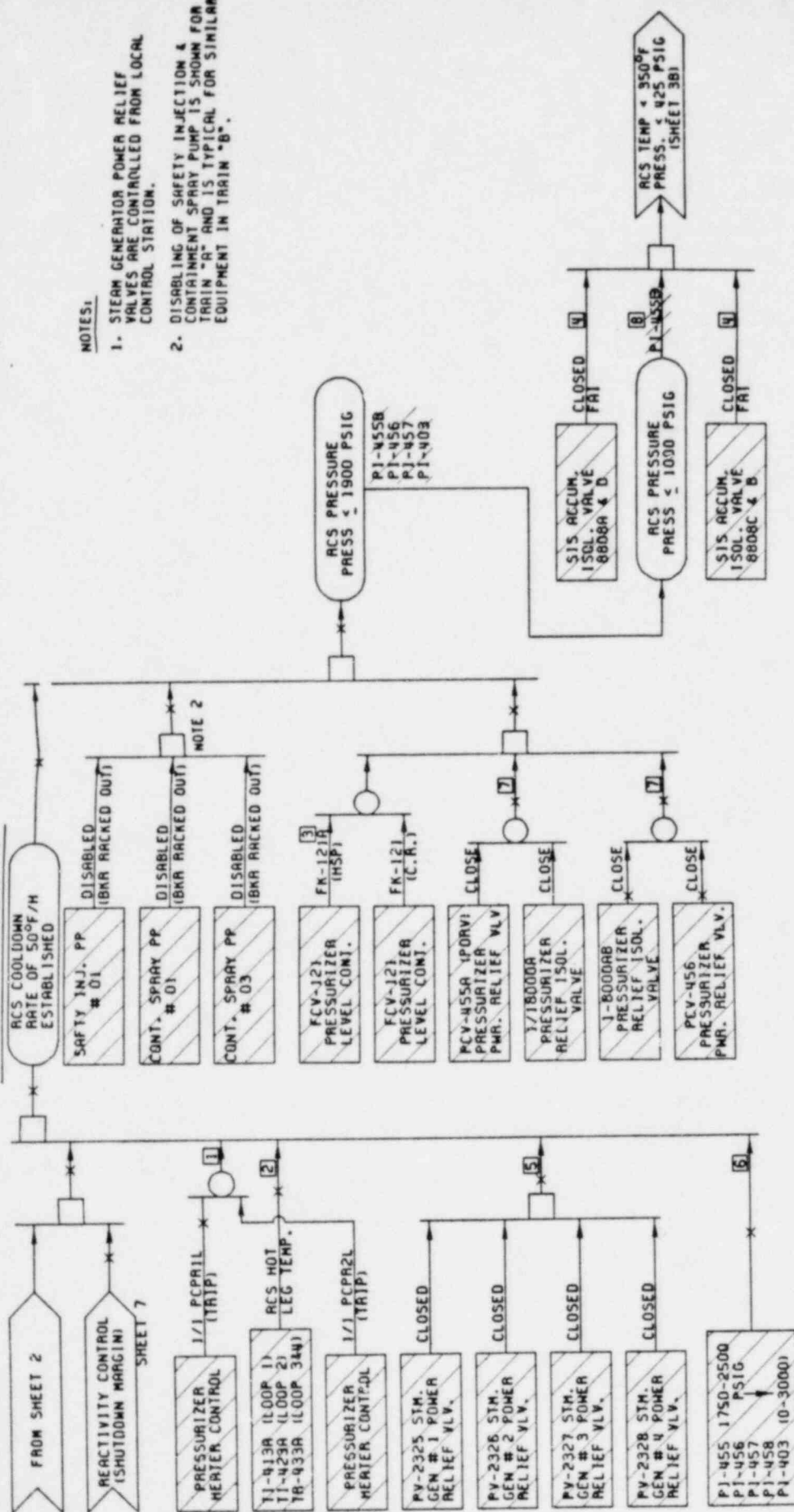
NOTES:

1. CONTROL ROOM POSTULATED FIRE COINCIDENT WITH LOSS OF OFFSITE POWER

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JOB NO. 11-2323-025

COLD SHUTDOWN



- NOTES:

1. STEAM GENERATOR POWER RELIEF VALVES ARE CONTROLLED FROM LOCAL CONTROL STATION.
2. DISABLING OF SAFETY INJECTION & CONTAINMENT SPRAY PUMP IS SHOWN FOR TRAIN "A" AND IS TYPICAL FOR SIMILAR EQUIPMENT IN TRAIN "B".

COMANCHE PEAK S.E.S.
1980-82-2300 MW INSTALLATION

Globe & Mail Inc.

TEXAS UTILITIES SERVICES INC.
AGENT FOR
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

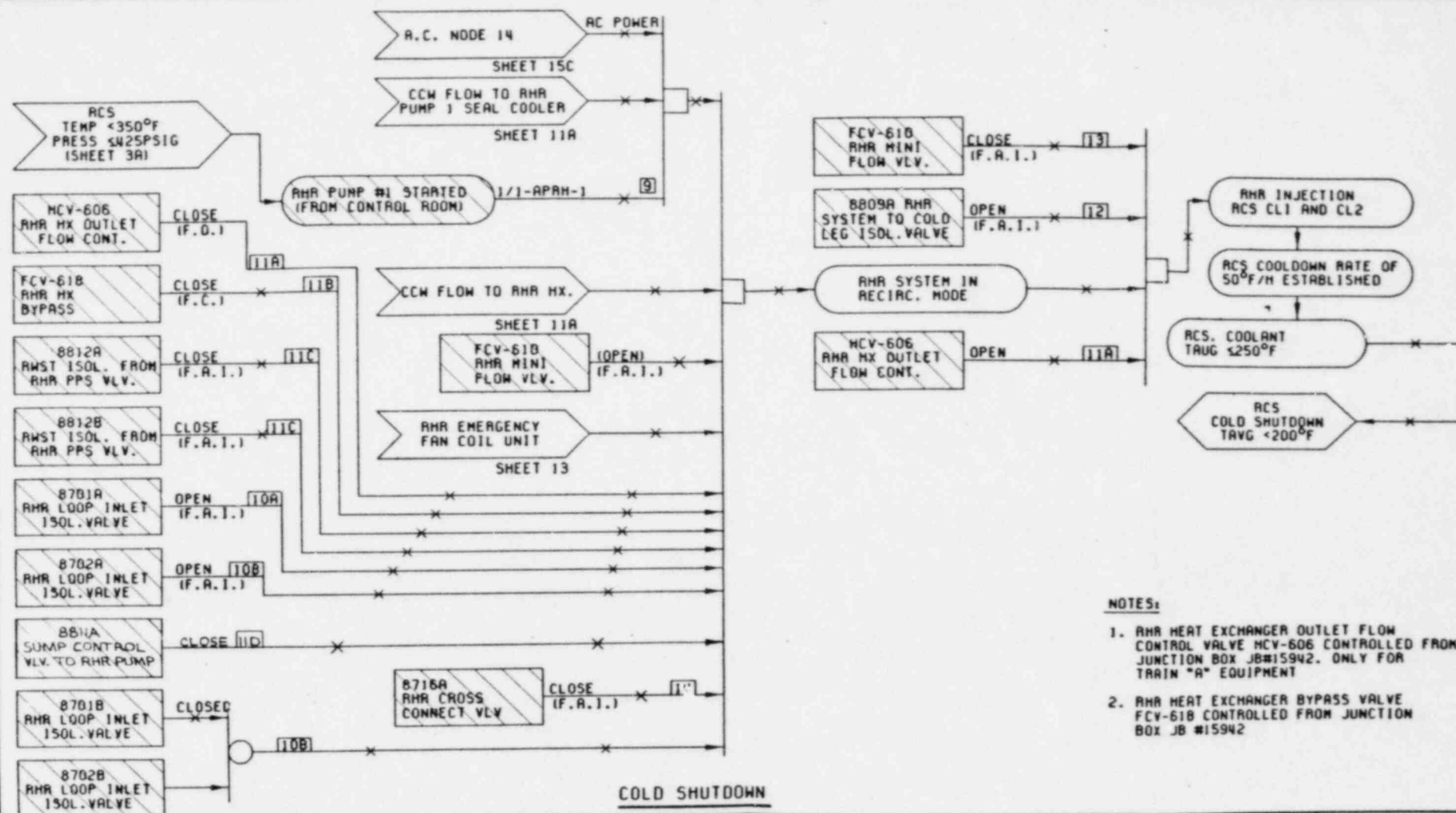
SHUTDOWN LOGIC DIAGRAMS

108 NO. 11-2323-025

JOB NO. 2323

SKETCH NO.
YA-2323-1800

SHEET NO. 3A OF 15



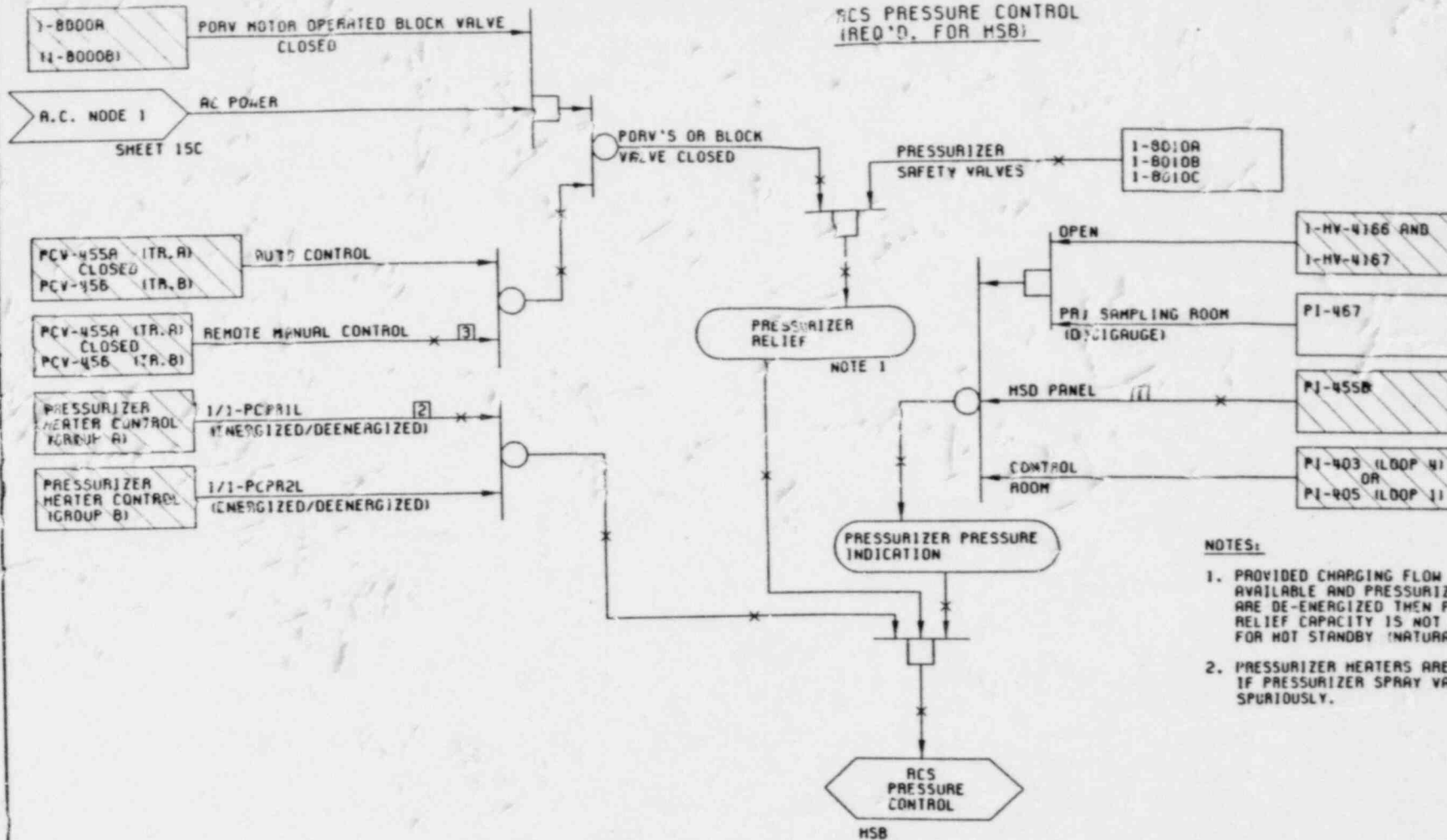
NOTES:

1. AHR HEAT EXCHANGER OUTLET FLOW CONTROL VALVE MCV-606 CONTROLLED FROM JUNCTION BOX JB#15942. ONLY FOR TRAIN "A" EQUIPMENT
2. AHR HEAT EXCHANGER BYPASS VALVE FCV-610 CONTROLLED FROM JUNCTION BOX JB #15942

										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323			
												SHUTDOWN LOGIC DIAGRAMS		SKETCH NO. XB-2323-1800			
														SHEET NO. 3B OF 15			
FIRE PROTECTION ANALYSIS										ISSUED FOR							
ISSUE NO.	DATE	DWN.	CHRD.	SOUND LDR	IAE	MECH	NUCLEAR	ELEC P.									

JOB NO. 11-2323-025

RCS PRESSURE CONTROL (REQ'D. FOR HSB)

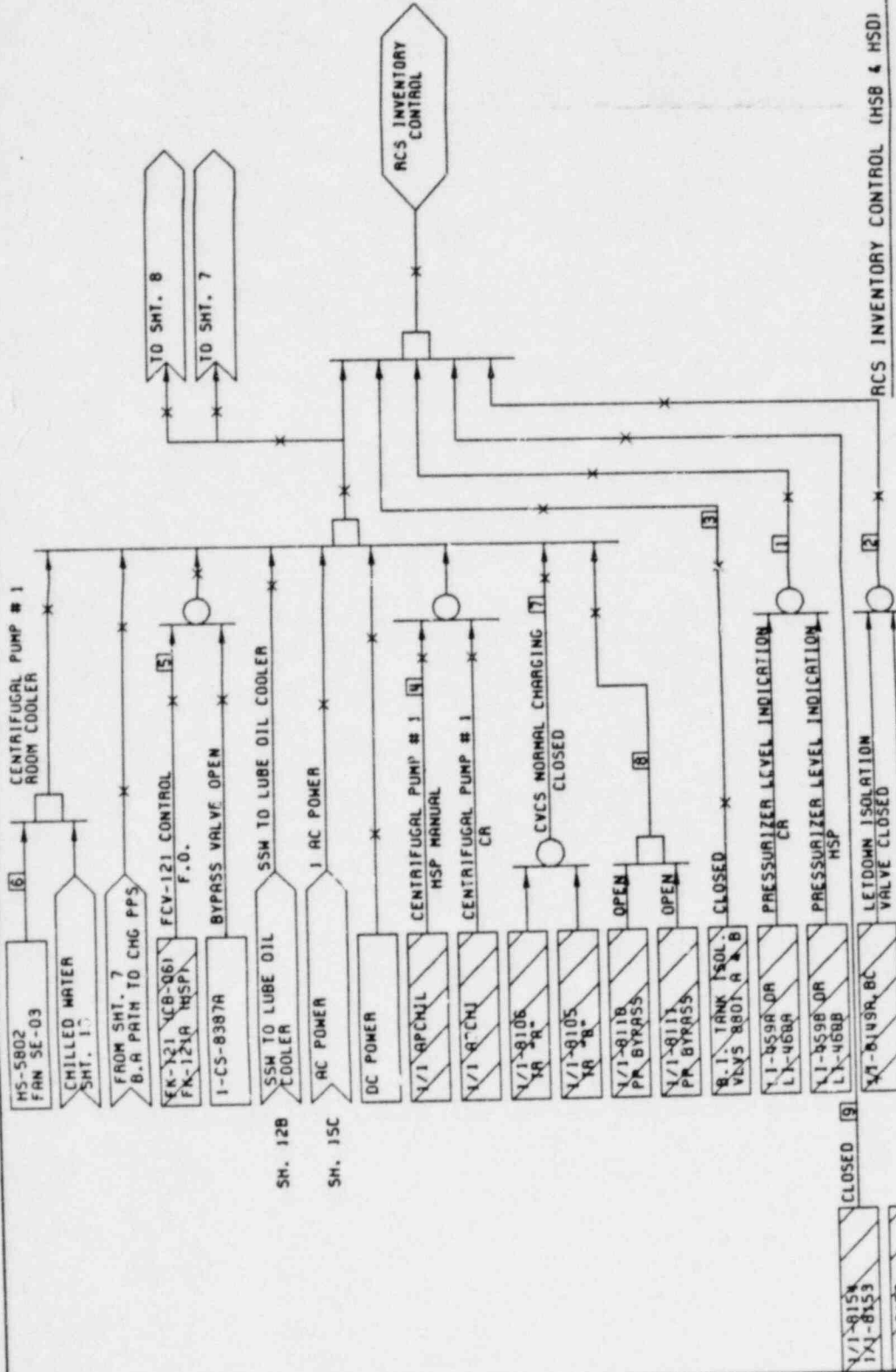


NOTES:

1. PROVIDED CHARGING FLOW CONTROL IS AVAILABLE AND PRESSURIZER HEATERS ARE DE-ENERGIZED THEN PRESSURIZER RELIEF CAPACITY IS NOT REQUIRED FOR HOT STANDBY (NATURAL CIRCULATION).
2. PRESSURIZER HEATERS ARE REQUIRED IF PRESSURIZER SPRAY VALVES OPEN SPURIOUSLY.

										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
										 ENGINEERING, ARCHITECTURE, INTERIORS NEW YORK		SHUTDOWN LOGIC DIAGRAMS		SKETCH NO. XB-2323-1800	
SHEET NO. 5 OF 15															
										FIRE PROTECTION ANALYSIS					
										ISSUED FOR					
A	WED														
ISSUE NO.	DATE	OWN.	CHRD.	SQUAD LDR	TAC	MECH	NUCLEAR	ELEC	P.E.						

JOB NO. 11-2323-025



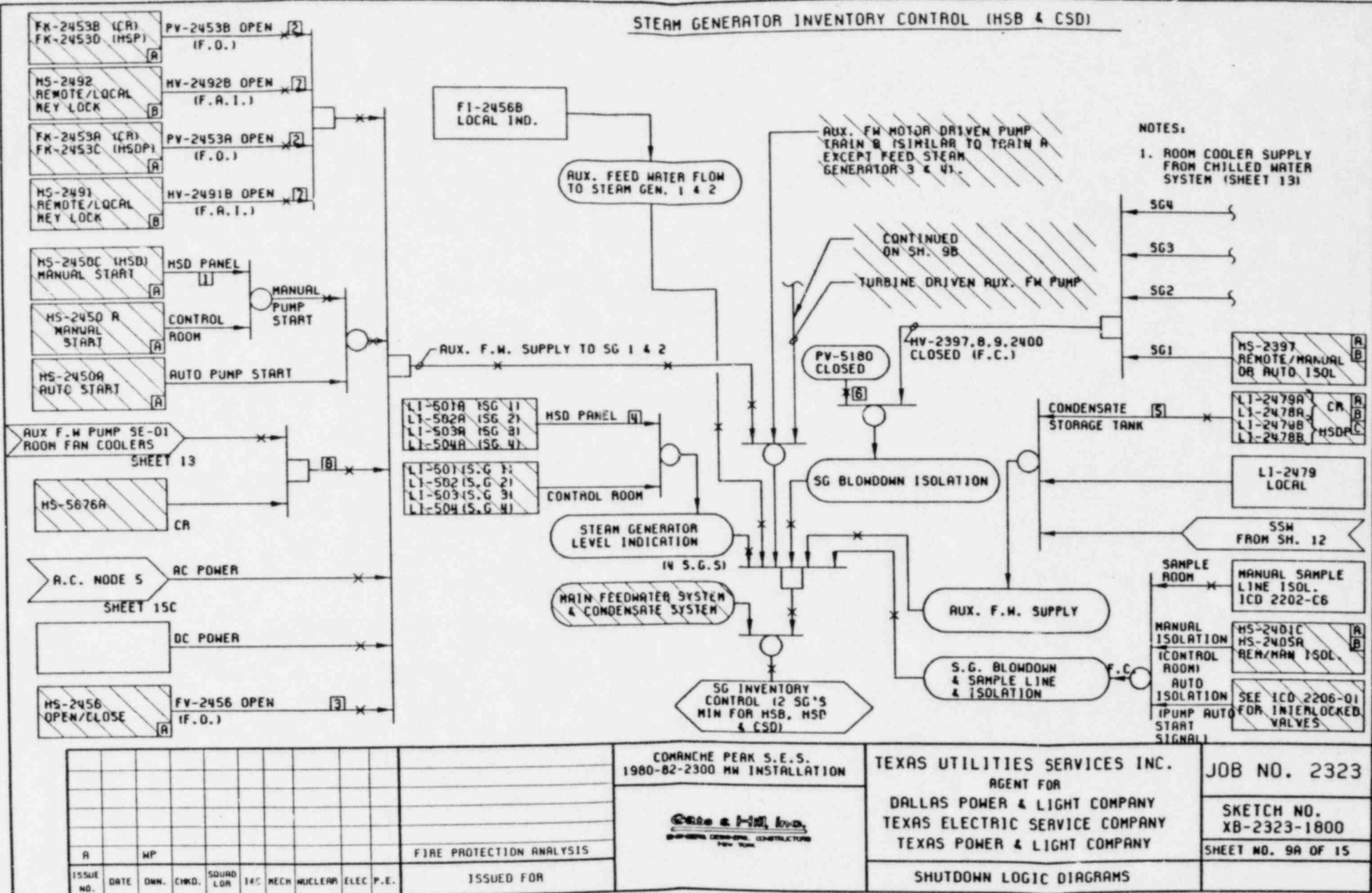
COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
FIRE PROTECTION ANALYSIS		SHUTDOWN LOGIC DIAGRAMS		SKETCH NO. XB-2323-1800	
ISSUED FOR				SHEET NO. 6 OF 15	
ISSUE NO.	DATE	DRN.	CHKD.	ISSUED	FOR
1/1-8153	1/1-8153				
1/1-8152					

NOTES:

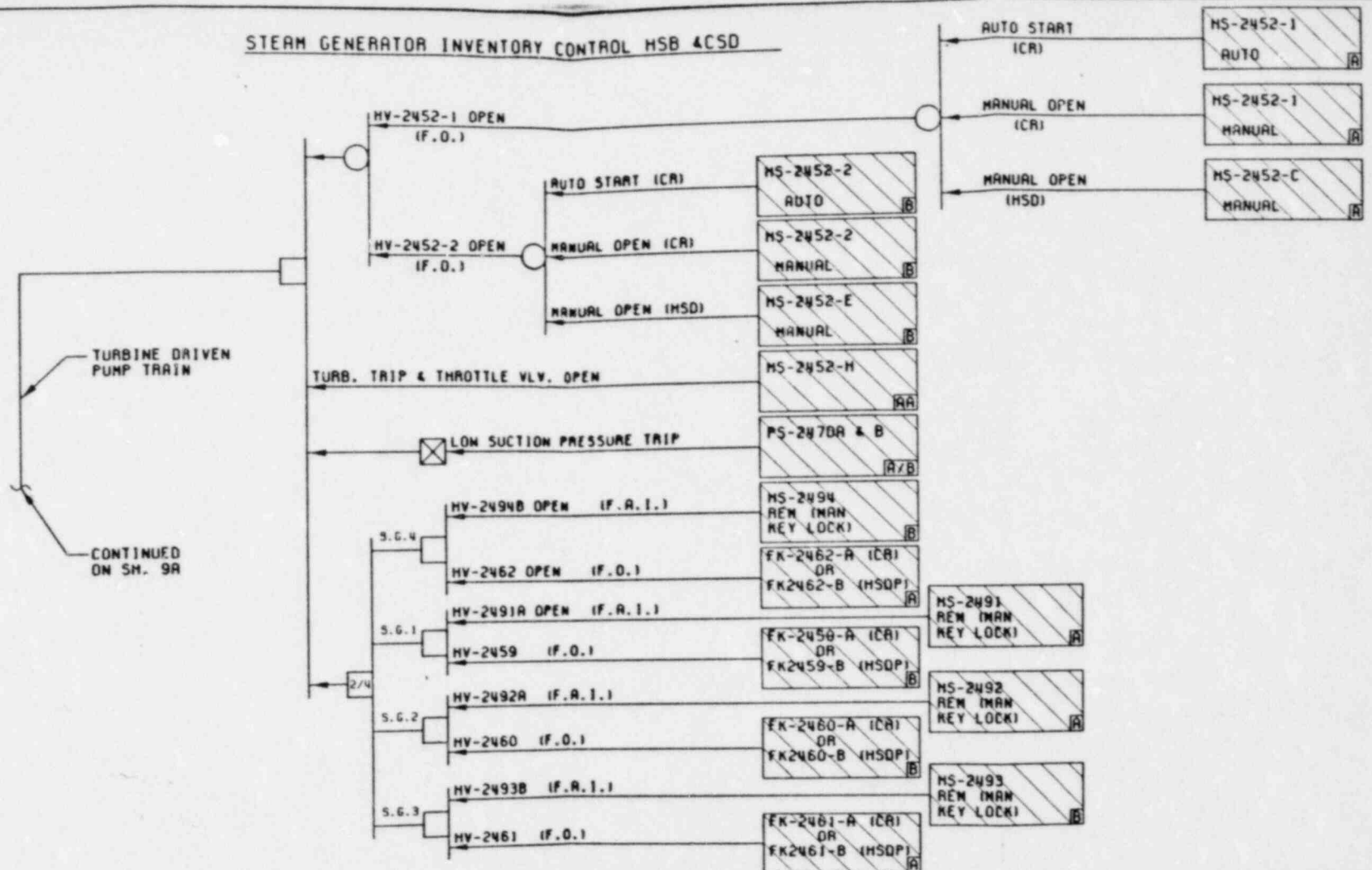
1. MANUAL VALVE LINEUP ONLY

[illegible]

JOB NO. 11-2323-025

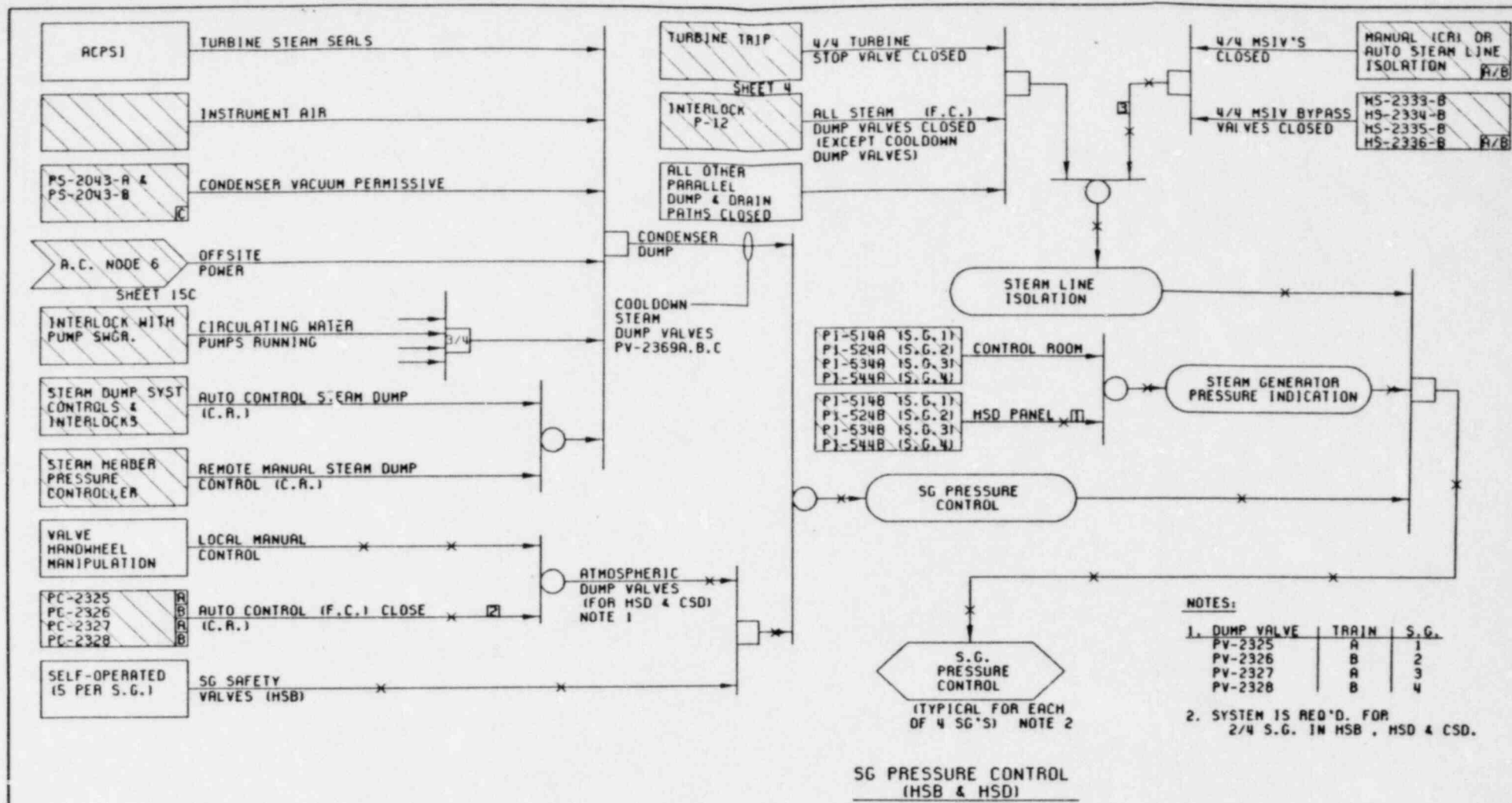


STEAM GENERATOR INVENTORY CONTROL HSB 4CSD



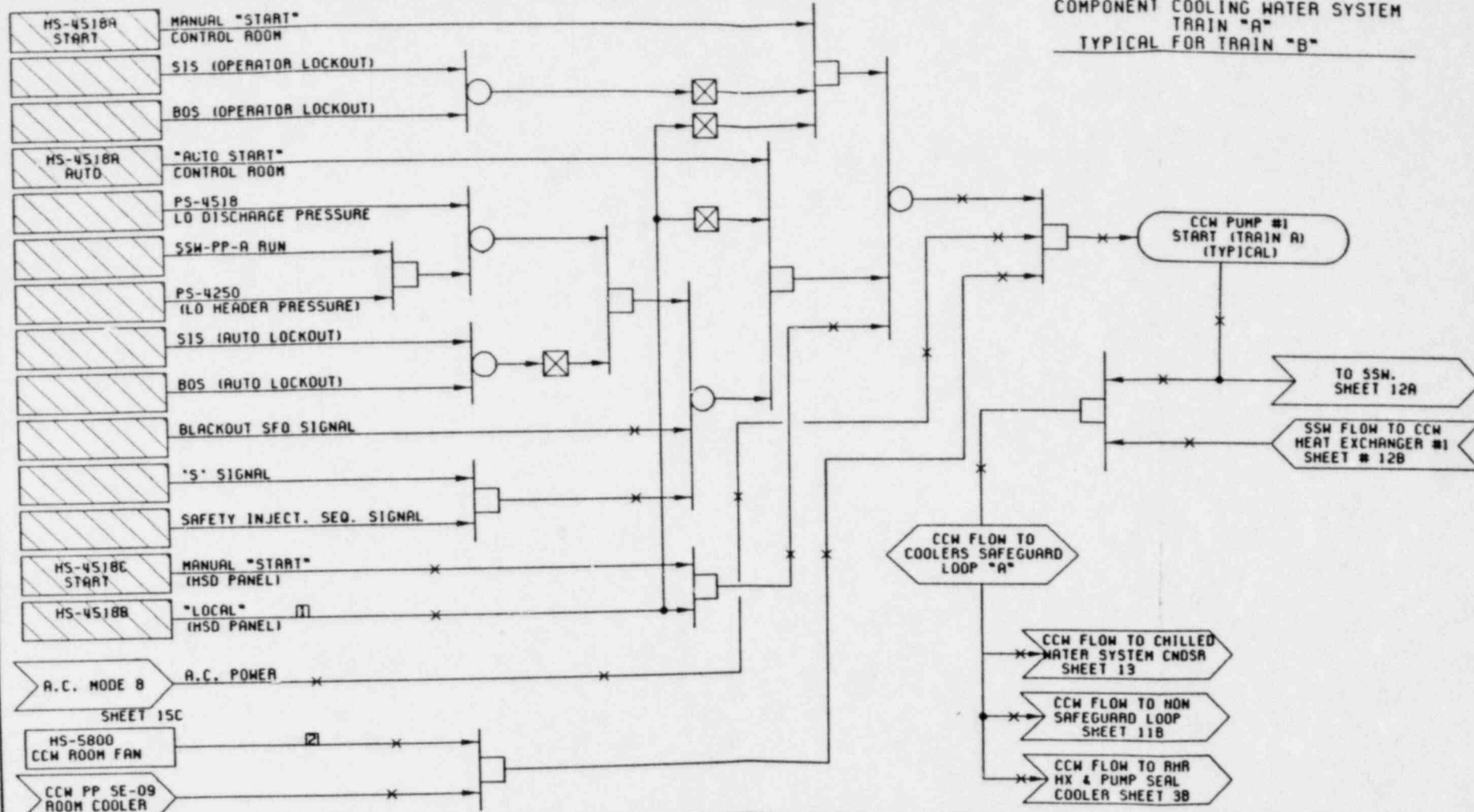
										CONACHE PEAK S.E.S. 1980-82-2300 MM INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
										 <small>POWER DESIGN CONSULTING</small>		SHUTDOWN LOGIC DIAGRAMS		SKETCH NO. XB-2323-1800	
														SHEET NO. 9B OF 15	
FIRE PROTECTION ANALYSIS															
ISSUED FOR															
ISSUE NO.	DATE	OWN.	CHGD.	SQUAD LDR	ISC	NECH	NUCLEAR	ELEC	P.E.						

JOB NO. 11-2323-025



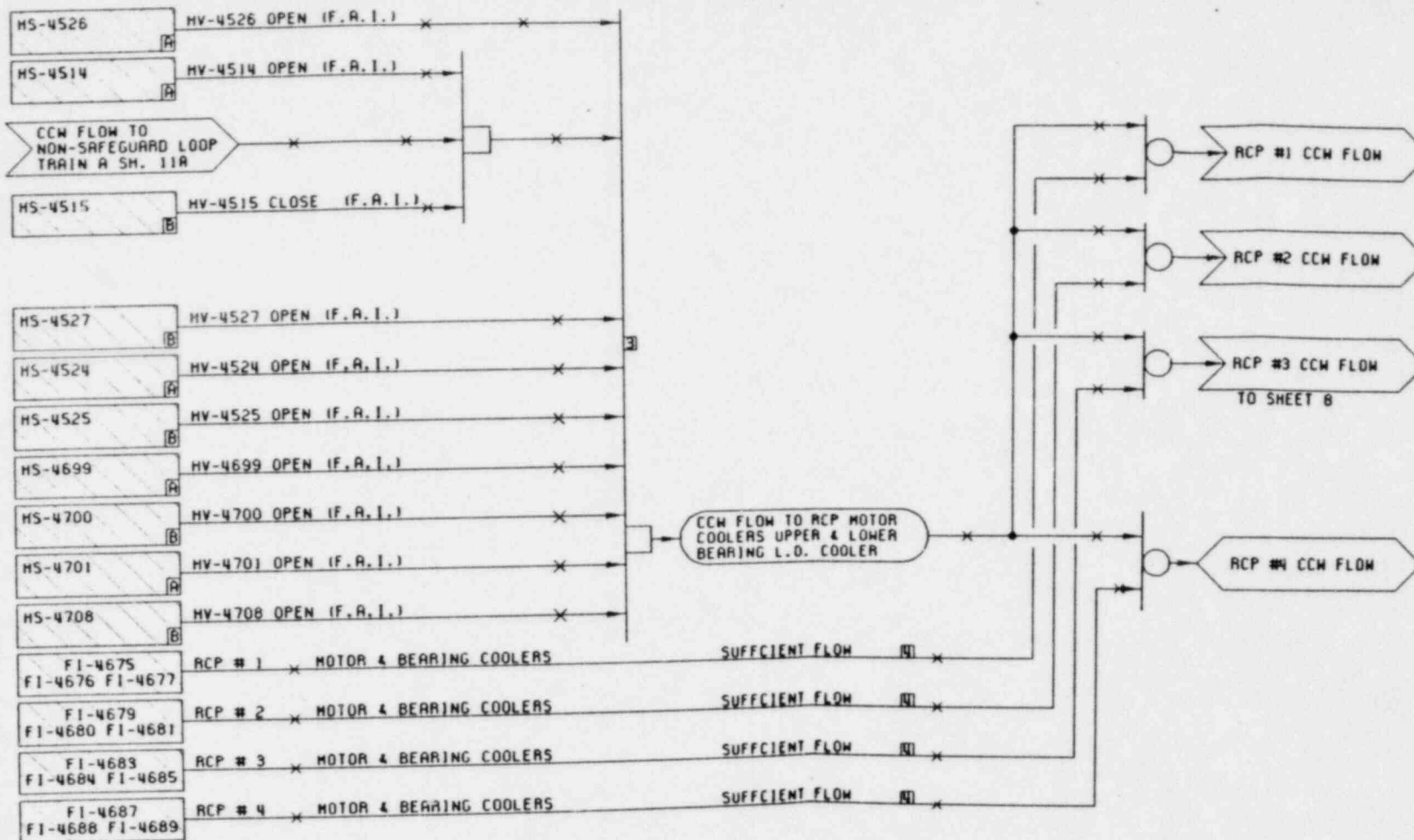
										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323
										Gate & Hill, Inc. ENGINEERING, DESIGN, CONSTRUCTION NEW YORK				SKETCH NO. XB-2323-1800
										FIRE PROTECTION ANALYSIS				SHEET NO. 10 OF 15
ISSUE NO.	DATE	DWN.	CHWD.	SQUAD LDR	TAC	NECH	NUCLEAR	ELEC	P.E.	ISSUED FOR		SHUTDOWN LOGIC DIAGRAMS		
A	WED													

COMPONENT COOLING WATER SYSTEM
TRAIN "A"
TYPICAL FOR TRAIN "B"



FR. 5H 13										CORANQUE PEAK S.E.S. 1980-82-2300 MW INSTALLATION										TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY										JOB NO. 2323									
										Gates & Hall, Inc. ENGINEERING, ARCHITECTURE, CONSTRUCTION NEW YORK																				SKETCH NO. XB-2323-1800									
																														SHEET NO. 11A OF 15									
A										FIRE PROTECTION ANALYSIS										SHUTDOWN LOGIC DIAGRAMS																			
ISSUE NO.										ISSUED FOR																													
DATE																																							
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TAC																																							
MECH																																							
NUCLEAR																																							
ELEC																																							
P.E.																																							

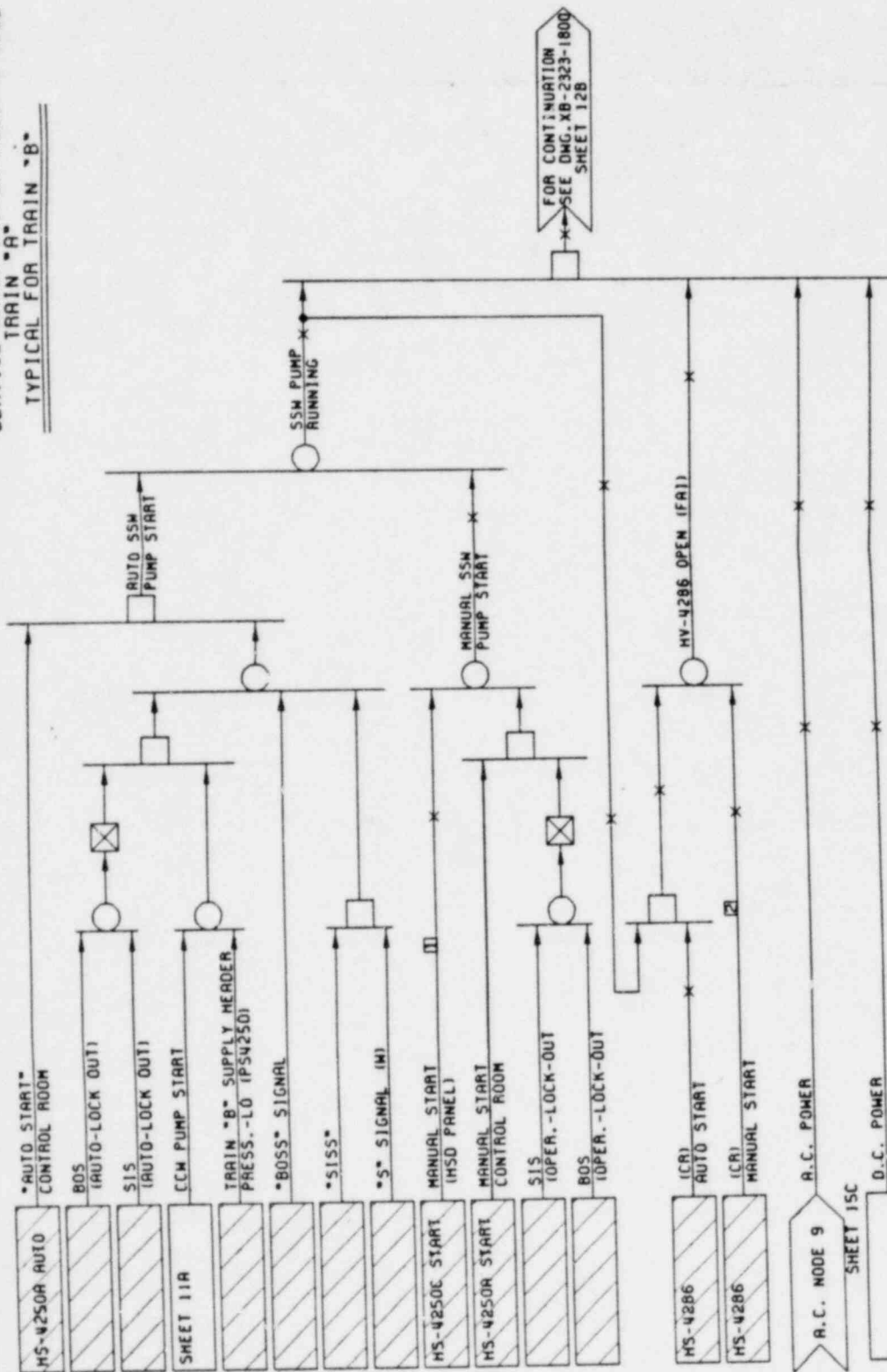
JOB NO. 11-2323-025



										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
												SHUTDOWN LOGIC DIAGRAMS		SKETCH NO. XB-2323-1800	
														SHEET NO. 11B OF 15	
FIRE PROTECTION ANALYSIS										ISSUED FOR					
ISSUE NO.	DATE	CHKD.	BY	SQUAD LDR	14C	MECH	NUCLEAR	ELEC	P.E.						
A	WED														

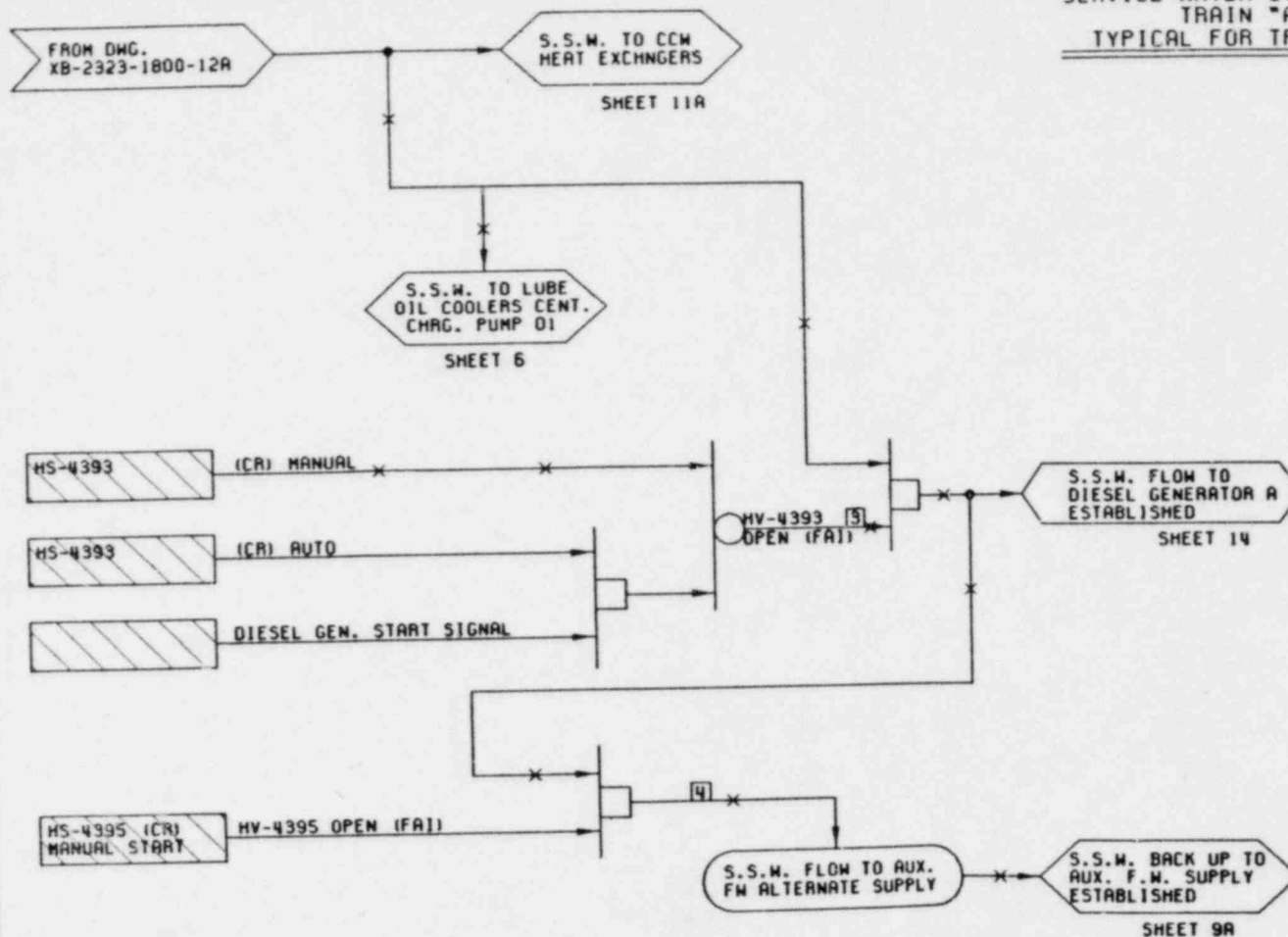
JOB NO. 11-2323-025

SERVICE WATER SYSTEM-HSB, HSD & CSD
TRAIN "A"
TYPICAL FOR TRAIN "B"



A.C. NODE 9		SHEET 13C		A.C. POWER		D.C. POWER	
MS-4250A AUTO		BOS (AUTO-LOCK OUT)		SLS (AUTO-LOCK OUT)		ECM PUMP START	
TRAIN "B" SUPPLY HEADER		PRESS.-LO (PS4250)		*BOSS* SIGNAL		*SLS*	
S SIGNAL (M)		MANUAL START (HSD PANEL)		MANUAL START CONTROL ROOM		SLS (OPER.-LOCK-OUT)	
BOS (OPER.-LOCK-OUT)		MS-4286 (ICR) AUTO START		MS-4286 (ICR) MANUAL START		HV-4286 OPEN (FAI)	
SSM PUMP RUNNING		AUTO SSM PUMP START		MANUAL SSM PUMP START			
COMANCHE PEAK S.E.S.		1980-82-2300 MW INSTALLATION		Texas Utilities Services Inc.		AGENT FOR	
Dallas Power & Light Company		Texas Electric Service Company		Texas Power & Light Company		JOB NO. 2323	
Sketch No.		XB-2323-1800		Sheet No.		12A OF 13	
SHUTDOWN LOGIC DIAGRAMS		JOB NO. 11-2323-025					

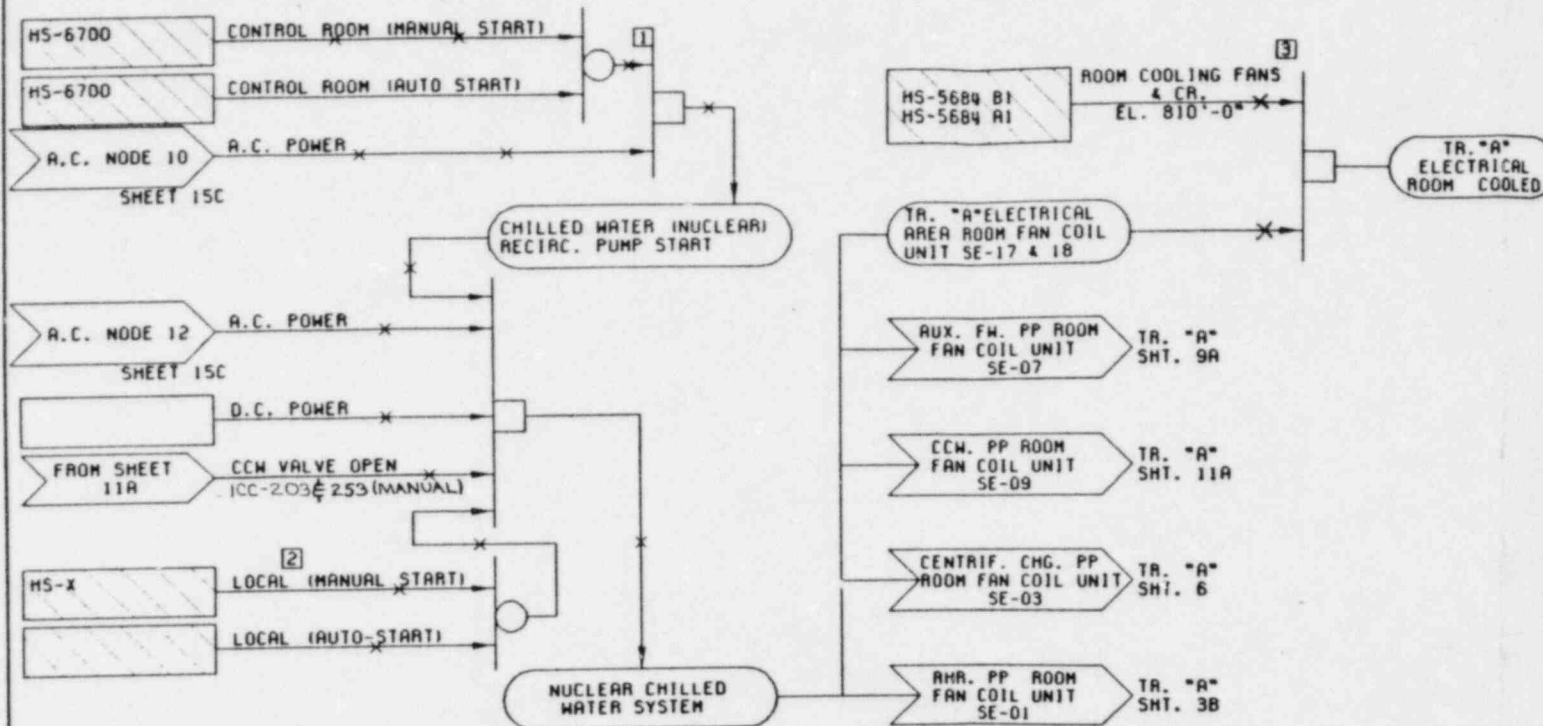
SERVICE WATER SYSTEM-HSB
TRAIN "A"
TYPICAL FOR TRAIN "B"



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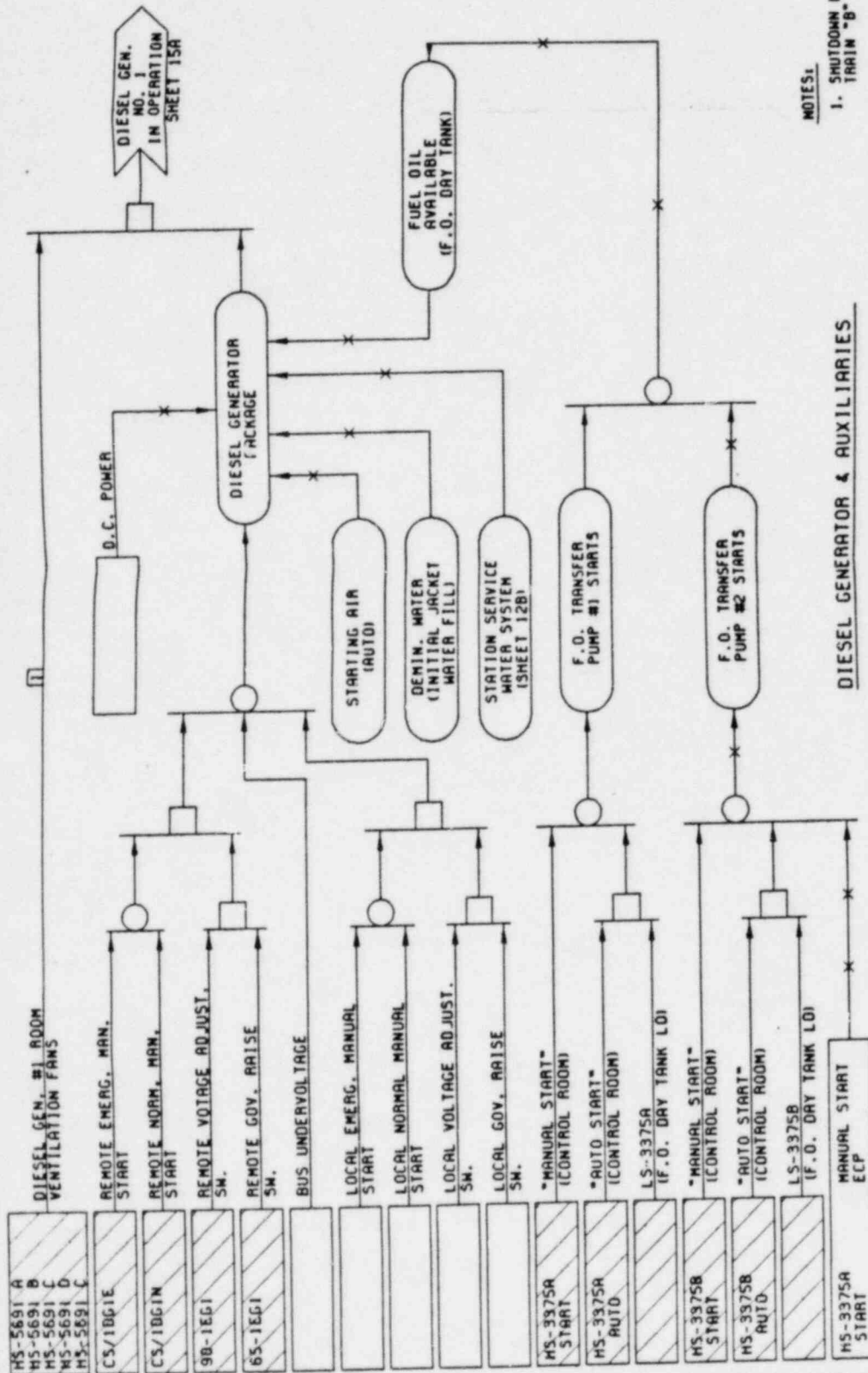
CHILLED WATER SYSTEM HSB, HSD & CSD

TRAIN A SHOWN
TRAIN B SIMILAR



										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323
												SHUTDOWN LOGIC DIAGRAMS		SKETCH NO. XB-2323-1800
SHEET NO. 13 OF 15														
A WED										FIRE PROTECTION ANALYSIS				
ISSUE NO.	DATE	OWN.	CHGD.	SOUND LDR	1AC	MECH	NUCLEAR	ELEC	P.E.	ISSUED FOR				

JOB NO. 11-2323-025



NOTES:

1. SHUTDOWN LOGIC SHOWN FOR TRAIN "A";
TRAIN "B" SIMILAR

DIESEL GENERATOR & AUXILIARIES

COMANCHE PEAK S.E.S.
1980-82-2300 MW INSTALLATION

Grubb & Parr, Inc.
FIRE PROTECTION CONSULTING
NEW YORK, N.Y.

FIRE PROTECTION ANALYSIS

ISSUED FOR

DATE DWN. CWD. LDR SQUAD LDR IAC MECH NUCLEAR ELEC P.E.

JOB NO. 2323

TEXAS UTILITIES SERVICES INC.
AGENT FOR
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

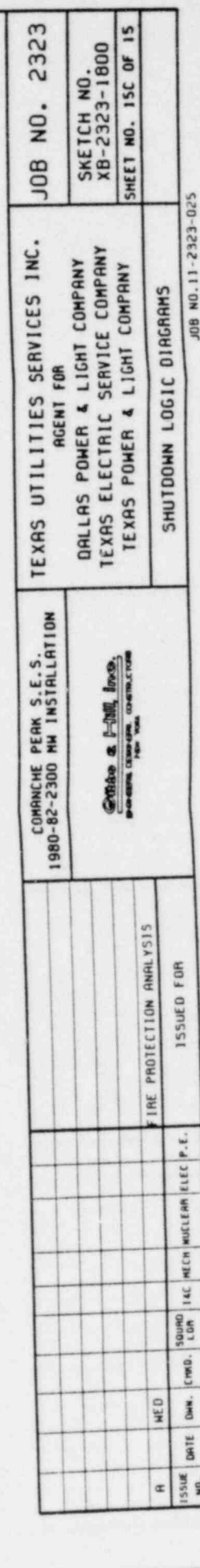
SKETCH NO.
XB-2323-1800

SHEET NO. 14 OF 15

SHUTDOWN LOGIC DIAGRAMS

JOB NO. 11-2323-025

108 NO. 11-2323-025

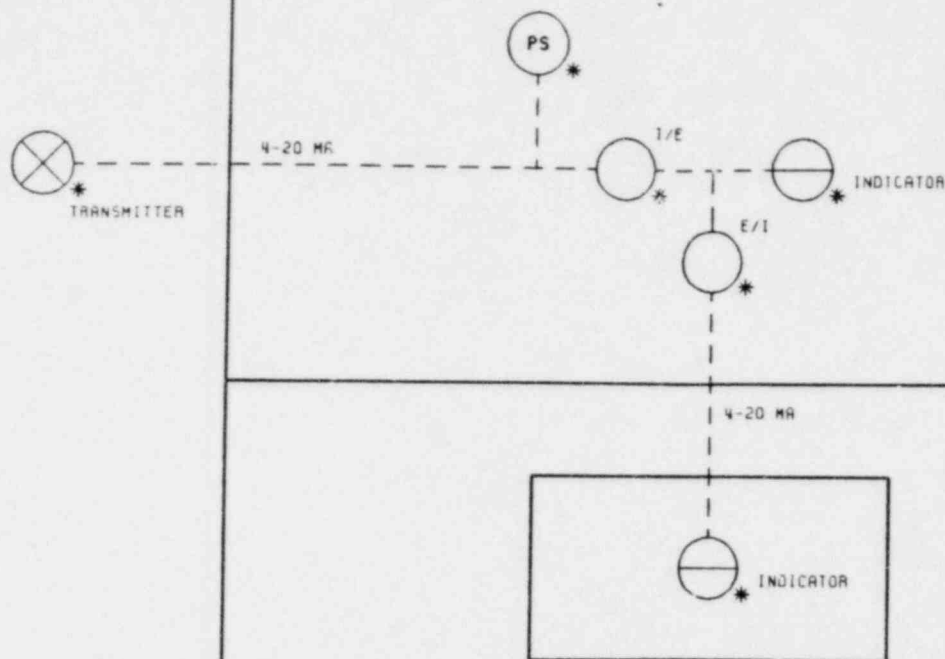


108 NO. 11-2323-025

FIELD

CONTROL ROOM (CR)

ATTACHMENT 2



LEGEND

- * - EXISTING
- * * - ADDED
- PS - POWER SUPPLY

HOT SHUTDOWN
PANEL (HSP)

FIGURE 1

COMANCHE PEAK S.E.S.
1980-82-2300 MW INSTALLATION

Geac & Hill, Inc.
COMMERCIAL INSTRUMENTAL, ELECTRONIC
NEW YORK

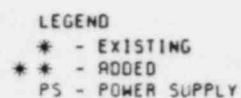
TEXAS UTILITIES SERVICES INC.
AGENT FOR
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

JOB NO. 2323

FIGURE NO. 1

JOB NO. 11-2323-025

CADRE/8323.2323



COMANCHE PEAK S.E.S.
1980-82-2300 MW INSTALLATION

Case & Hall, Inc.
22-29-22000, 22-29-22001, 22-29-22002, 22-29-22003
1-800-368-3688

JOB NO. 2323

FIGURE NO. 2

FIELD

CONTROL ROOM (CA)

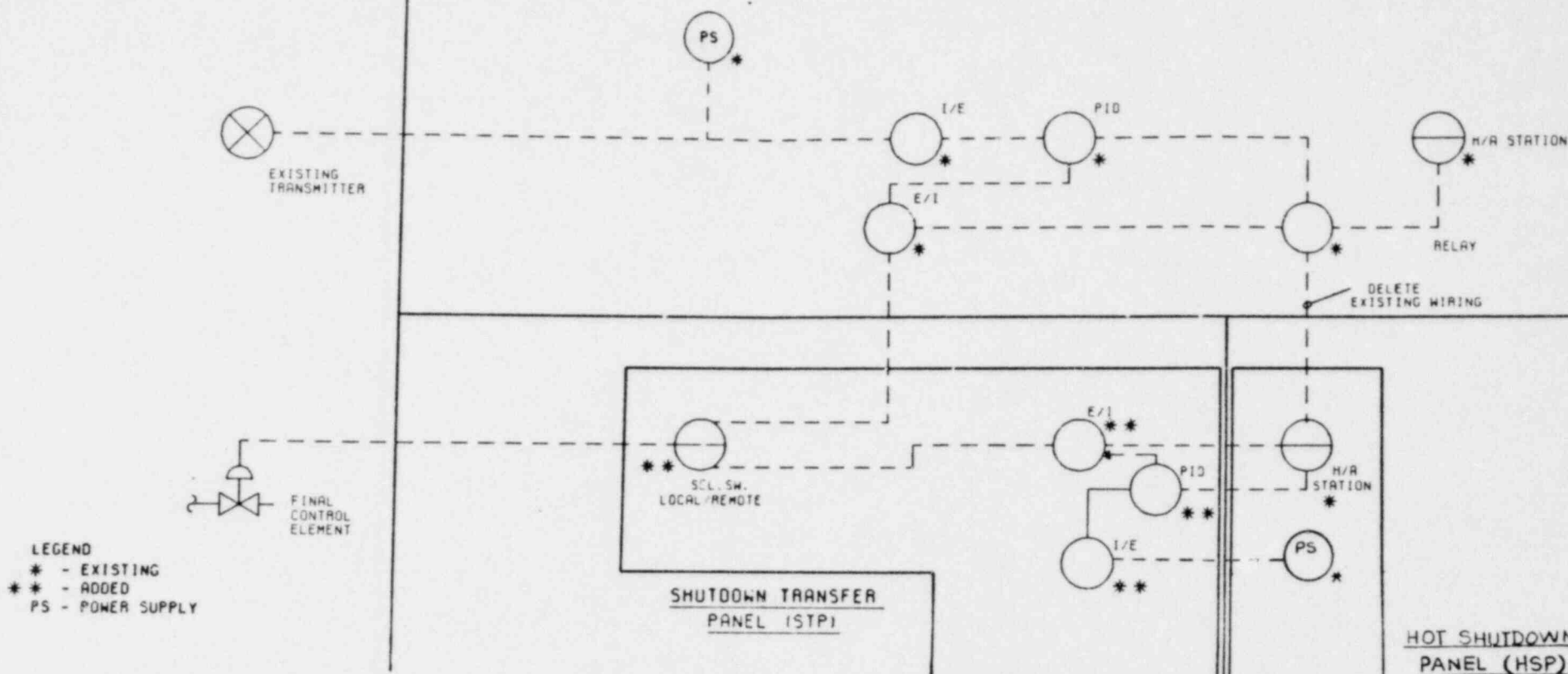


FIGURE 3

COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION	TEXAS UTILITIES SERVICES INC. AGENT FOR	JOB NO. 2323
Globe & I-ONE, Inc. ENGINEERING, DESIGN, PROGRAMMING, CONSTRUCTION FEB 1984	DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY	FIGURE NO. 3

JOB NO. 11-2923-025

CADRE / 8323.2523

CONTROL ROOM (CR)

DELETE & REWIRE
AS SHOWN

FIELD

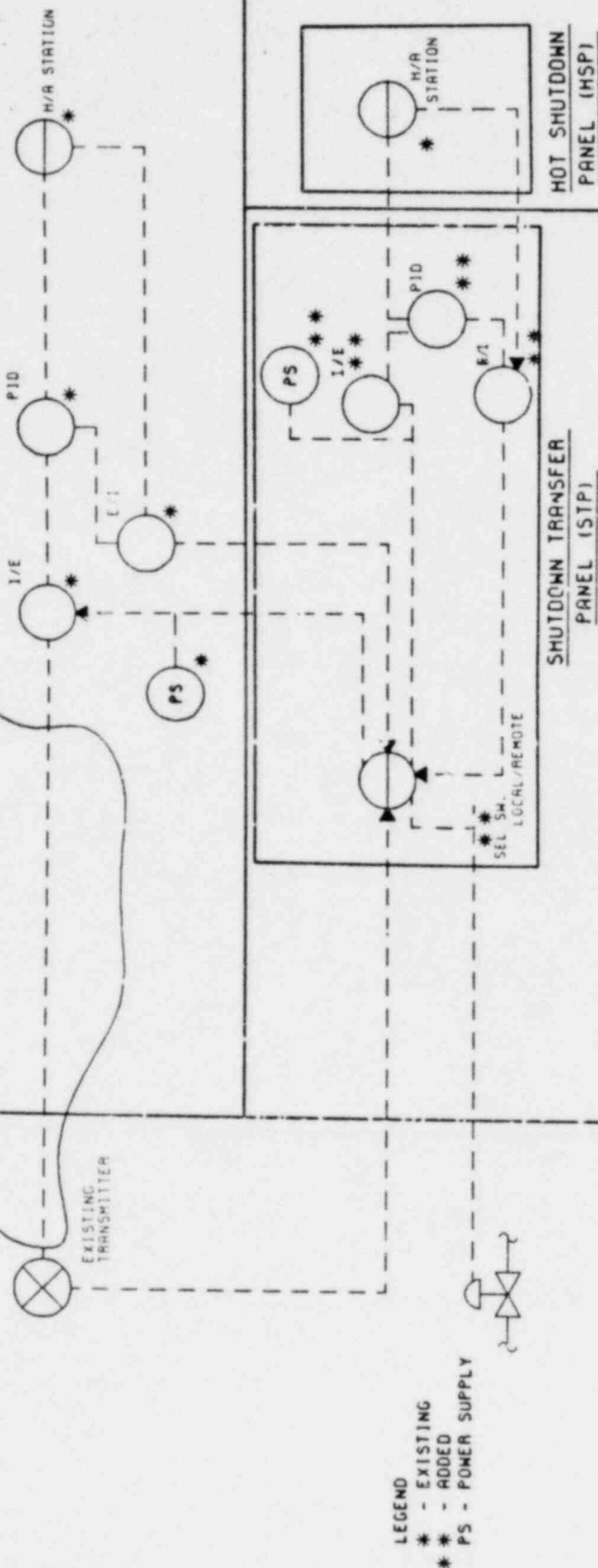


FIGURE 3A

COMANCHE PEAK S.E.S.
1980-82-2300 MW INSTALLATION

Griffin & Hines, Inc.
Electrical Engineering & Construction

TEXAS UTILITIES SERVICES INC.

AGENT FOR

DALLAS POWER & LIGHT COMPANY

TEXAS ELECTRIC SERVICE COMPANY

TEXAS POWER & LIGHT COMPANY

JOB NO. 2323

FIGURE NO. 3A

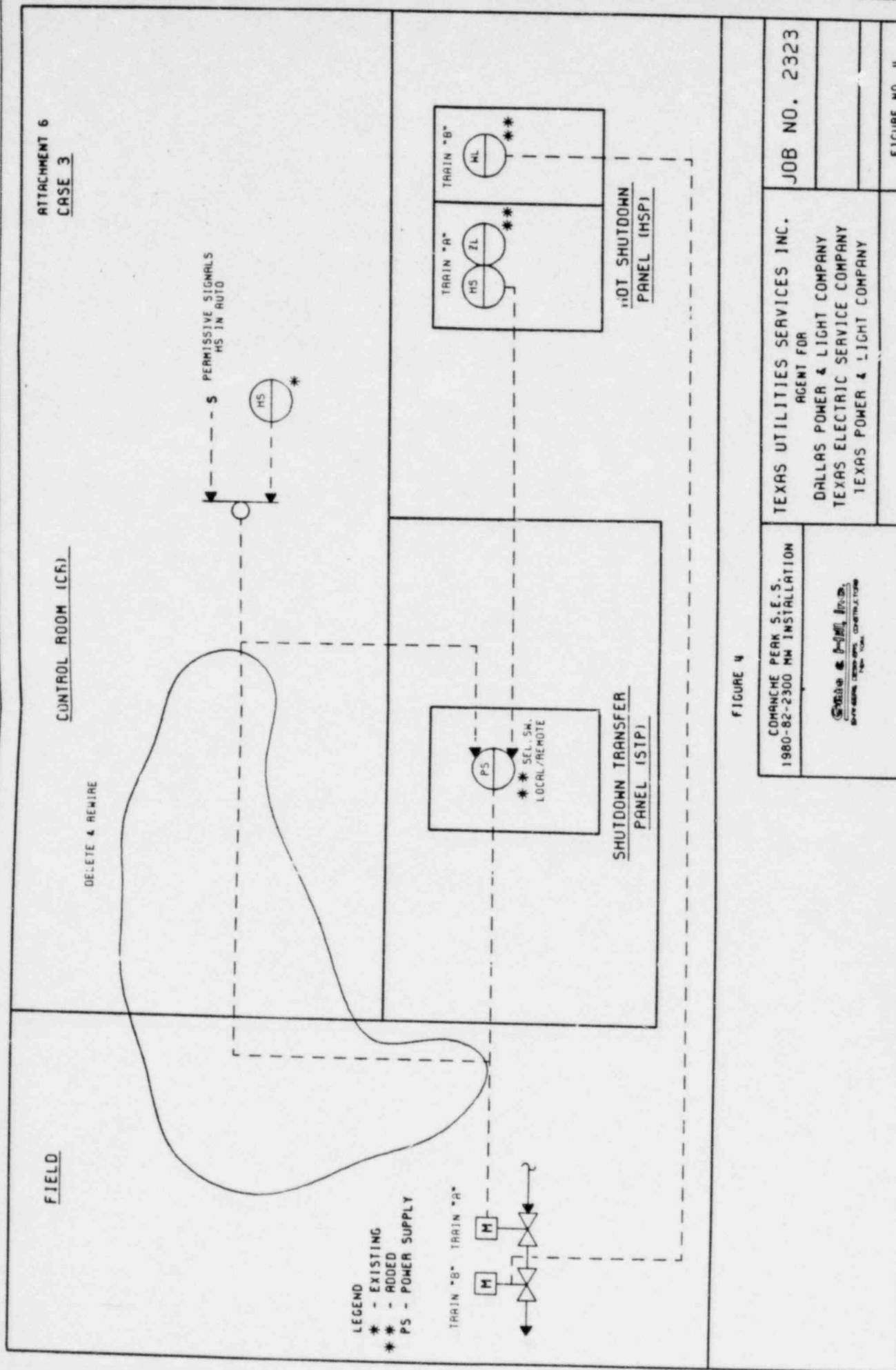


FIGURE 4

COMANCHE PEAK S.E.S.
1980-82-2300 MW INSTALLATION

Grubb & Parr, Inc.
ENGINEERING, DESIGN, AND CONSTRUCTION

TEXAS UTILITIES SERVICES INC.
AGENT FOR
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

JOB NO. 2323

FIGURE NO. 4

FIELD

CONTROL ROOM (CR)

ATTACHMENT 7
CASE 4



LEGEND
* - EXISTING
* - ADDED
PS - POWER SUPPLY

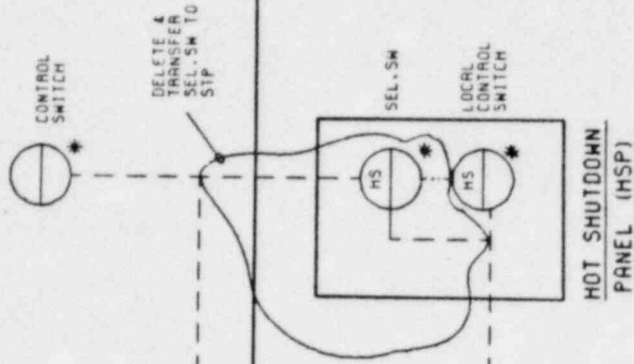


FIGURE 5

COMANCHE PEAK S.E.S.
1980-82-2300 MW INSTALLATION

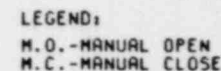
Grube & Pines, Inc.
ELECTRICAL ENGINEERING
1400 N. 10TH AVE.
DALLAS, TEXAS 75201

TEXAS UTILITIES SERVICES INC.
AGENT FOR

DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

JOB NO. 2323

FIGURE NO. 5



FIRE PROTECTION ANALYSIS

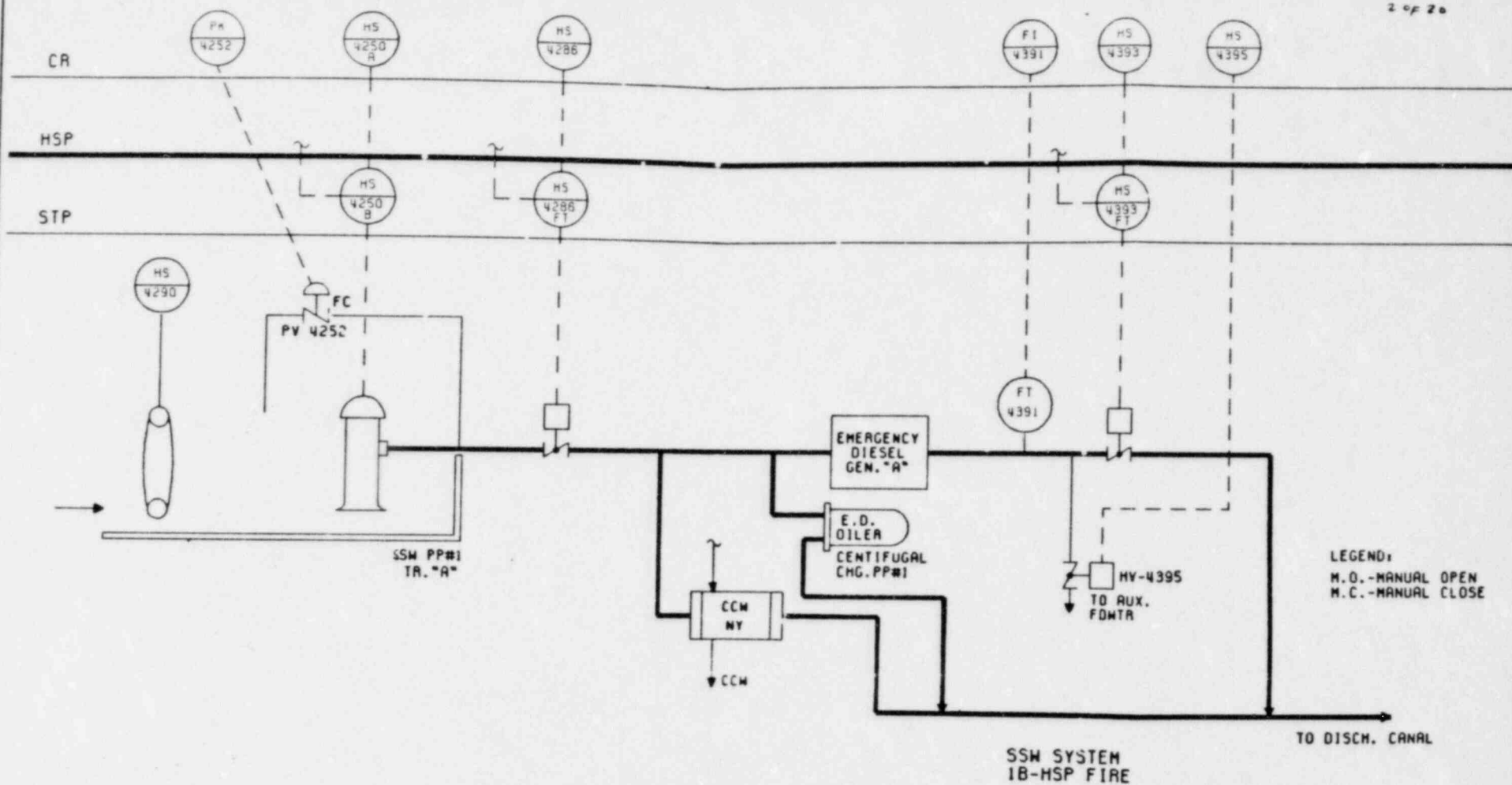
ISSUED FOR

Geis & HGL, Inc.
 100-100th Street, 100-100th Street, 100-100th Street
 New York, N.Y. 10011

SW SYSTEM CR FIRE

SHEET NO.

04/20/01 CADRE/8329.2929



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MS 4396

MS 4394

MS 4287

MS 4251

MS 4251

MS 4251

HSP

STP

PV-4253

EMERGENCY DIESEL GEN. "B"

E.O. OILER CENTIFUGAL CHG. (P.P.)

CCM NY

ISW PP#1 TR. "B"

HV-4396 TO AUX. FDMTR

LEGEND:

M.O. - MANUAL OPEN

M.C. - MANUAL CLOSE

TO DISCH. CANAL

SW SYSTEM IC-STP FIRE

COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION

George & H. Inc. 100 YEARS OF SERVICE TO THE ELECTRICITY INDUSTRY

TEXAS UTILITIES SERVICES INC. AGENT FOR

DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

JOB NO. 2323

MINI P & ID IC

SHEET NO.

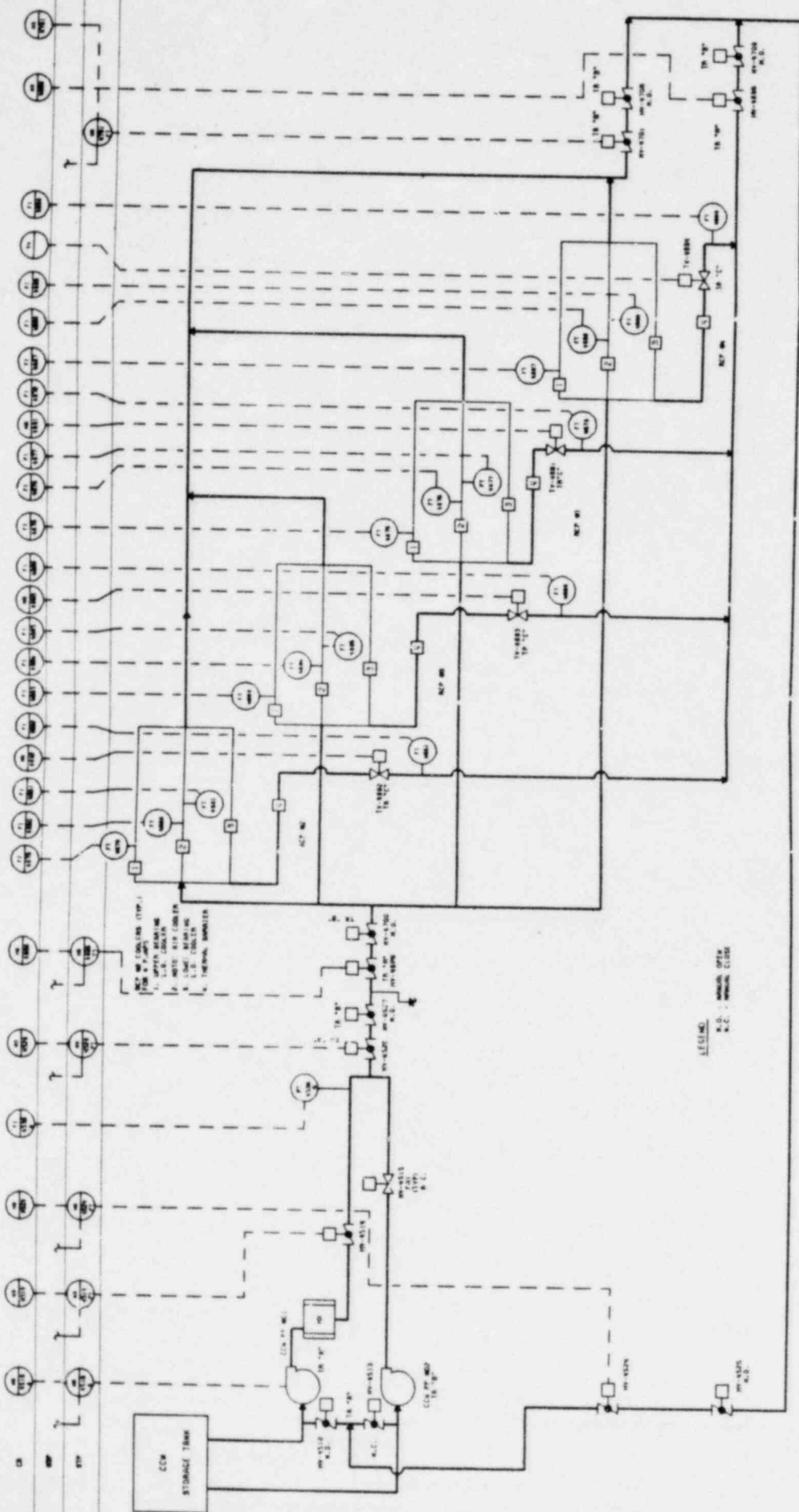
SW SYSTEM CR FIRE

JOB NO. 11-2323-025

DATE: 08/28/81 CADRE: 8313.2123

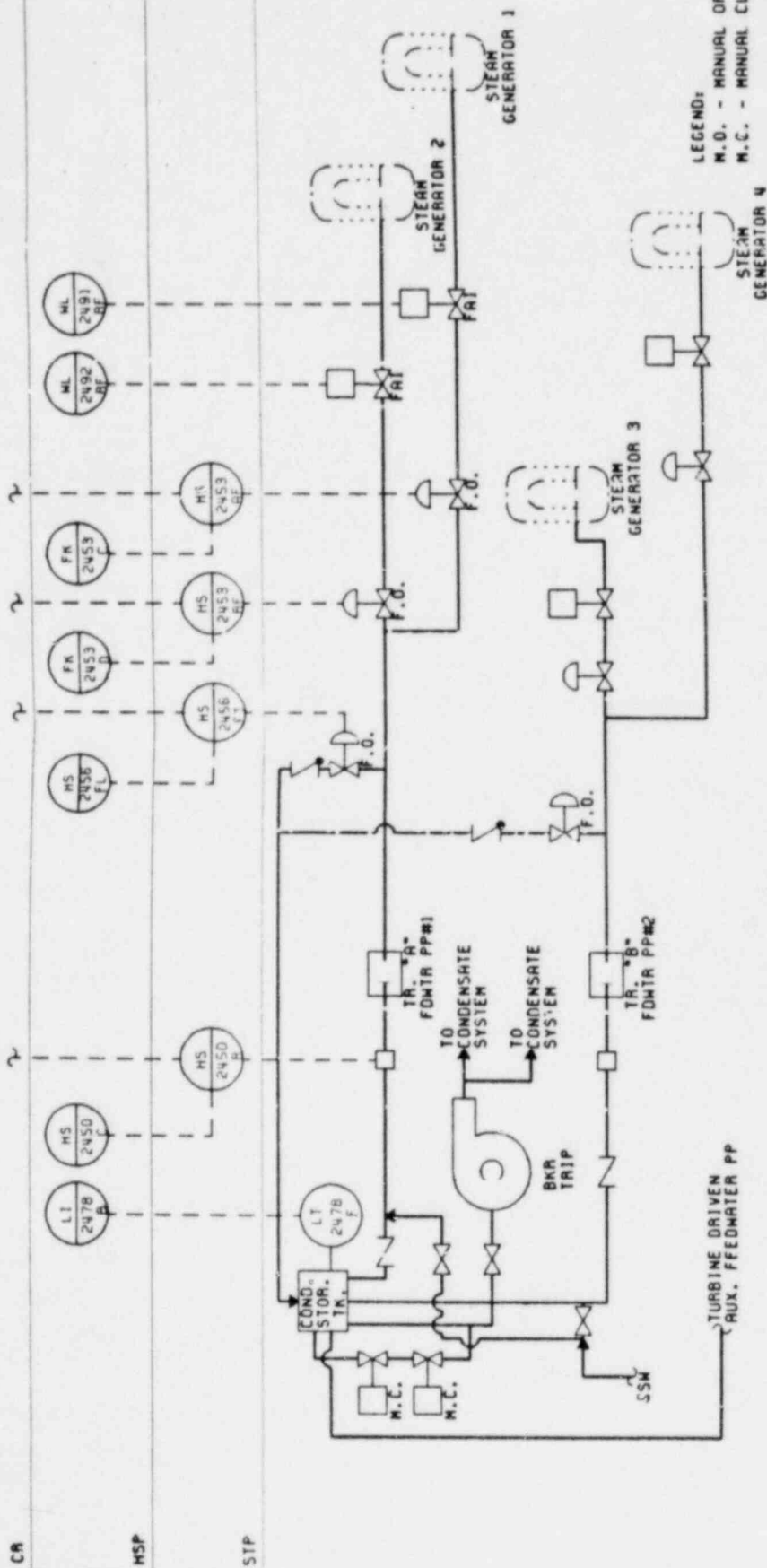
ISSUED FOR

ISSUE NO. DATE DWN. CMO. SQUAD LOR. MEC. NUCLEAR ELEC. P.E.



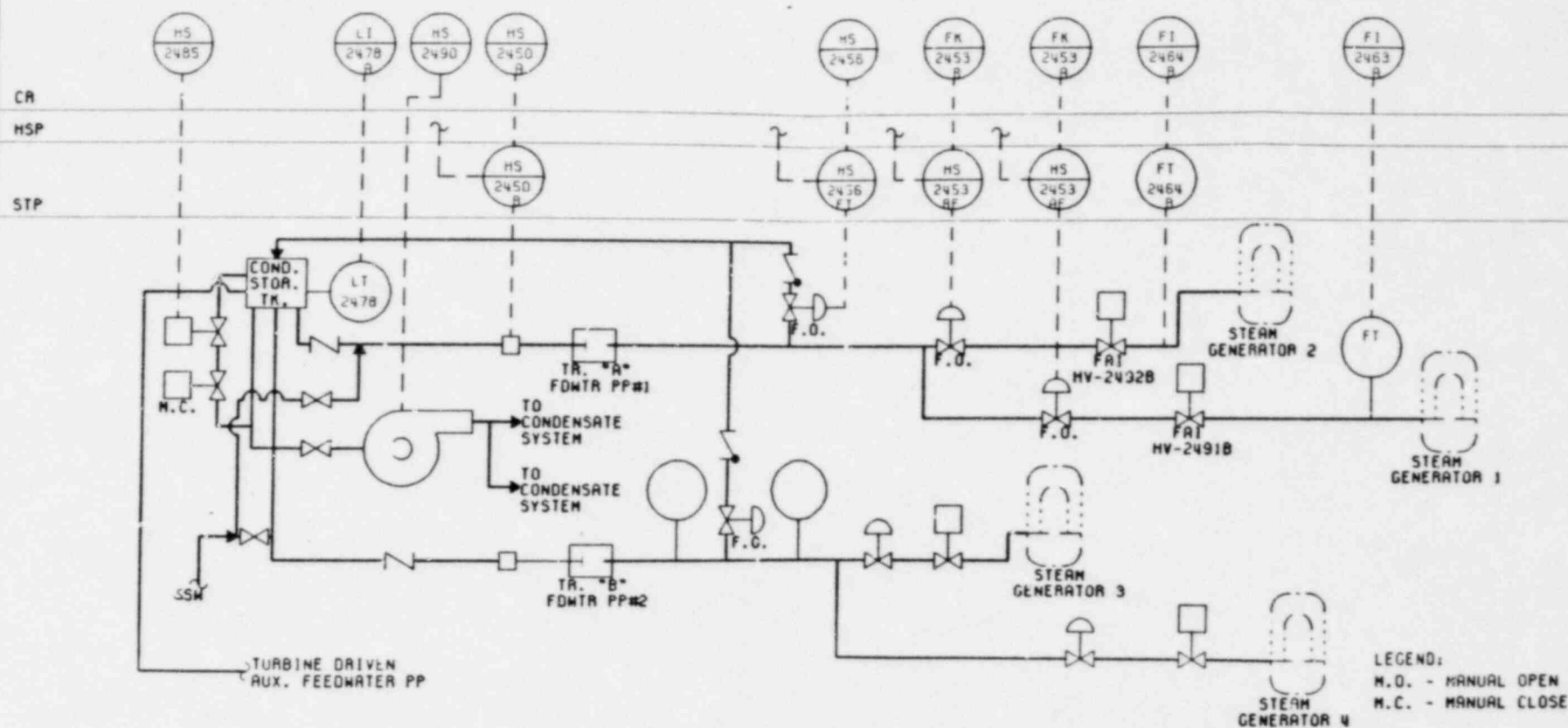
CCM SYSTEM
20- MSP FINE

<p>COMPANY: T&E S.E.S. 1000 E. 10th St., Suite 100, Tulsa, OK 74103</p>	<p>TEAMS UTILITIES SERVICES, INC. 1000 E. 10th St., Suite 100, Tulsa, OK 74103</p>	<p>DRILLING POWER & LIGHT COMPANY TECHNICAL SERVICE COMPANY TECHNICAL POWER & LIGHT COMPANY</p>	<p>JOB NO. 2323</p>
<p>DATE: 10/1/00</p>	<p>PROJECT: 1000 E. 10th St., Suite 100, Tulsa, OK 74103</p>	<p>CLIENT: T&E S.E.S.</p>	<p>WSP F & L 20</p>
<p>DESIGNER: T&E S.E.S.</p>	<p>ENGINEER: T&E S.E.S.</p>	<p>CONTRACTOR: T&E S.E.S.</p>	<p>DATE: 10/1/00</p>

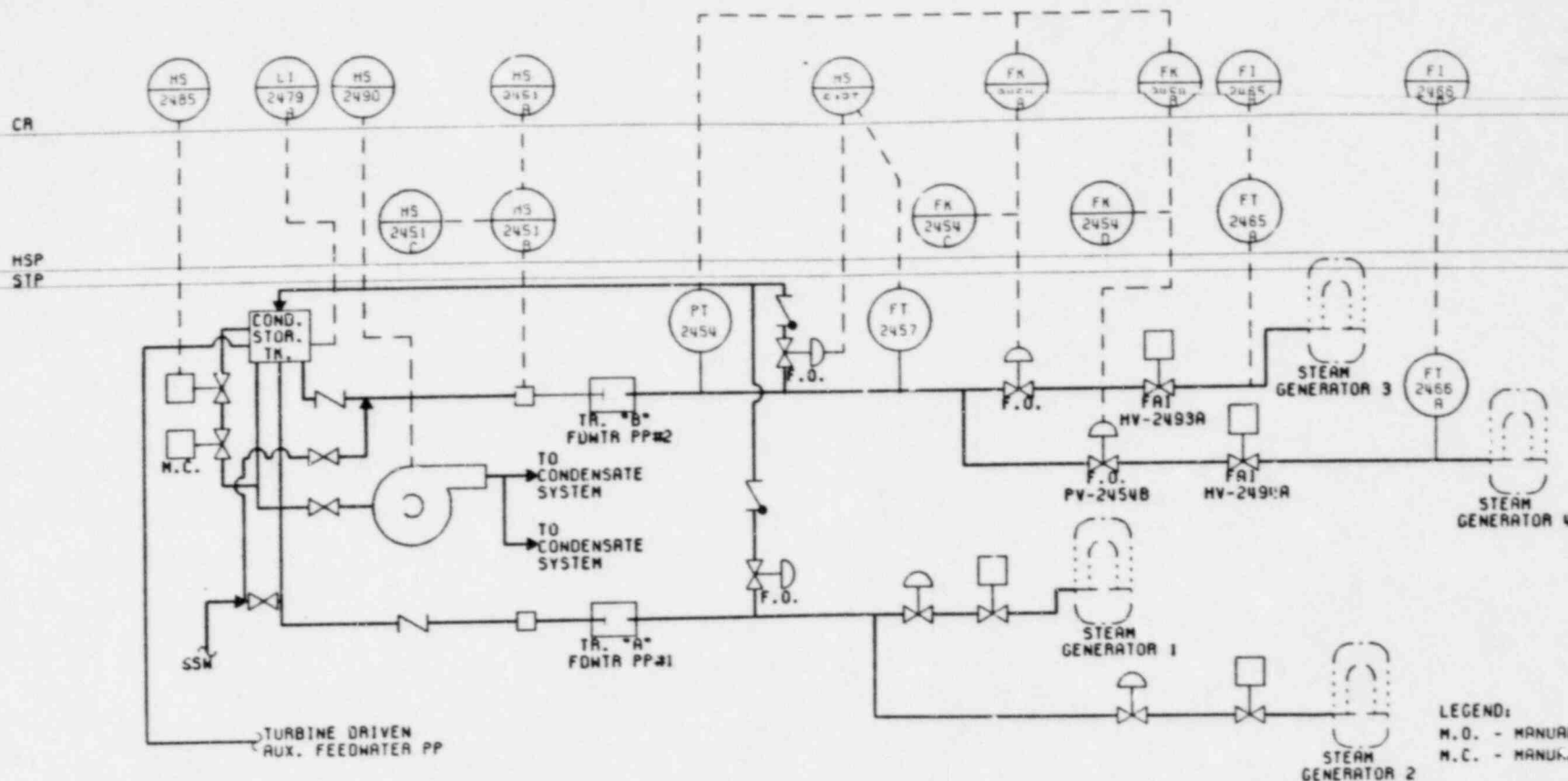


S.G. INVENTORY CONTROL
3A - CR FIRE

COMANCHE PEAK S.E.S. 1960-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323
FIRE PROTECTION ANALYSIS		SHUTDOWN LOGIC DIAGRAMS		MINI P & ID 3A
ISSUE NO.	DATE	CHKD. BY	ISSUED FOR	
1	ME	DATE	ISSUED FOR	

S.G. INVENTORY CONTROL
3B - HSP FIPE

										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
										 ENGINEERS, ARCHITECTS, CONSULTANTS HOUSTON, TEXAS		SHUTDOWN LOGIC DIAGRAMS		MINI P & ID 3B	
FIRE PROTECTION ANALYSIS															
ISSUE NO.	DATE	OWN.	CHD.	SQUAD LDR	14C	MECH	NUCLEAR	ELEC	P.E.	ISSUED FOR					
A		ME													

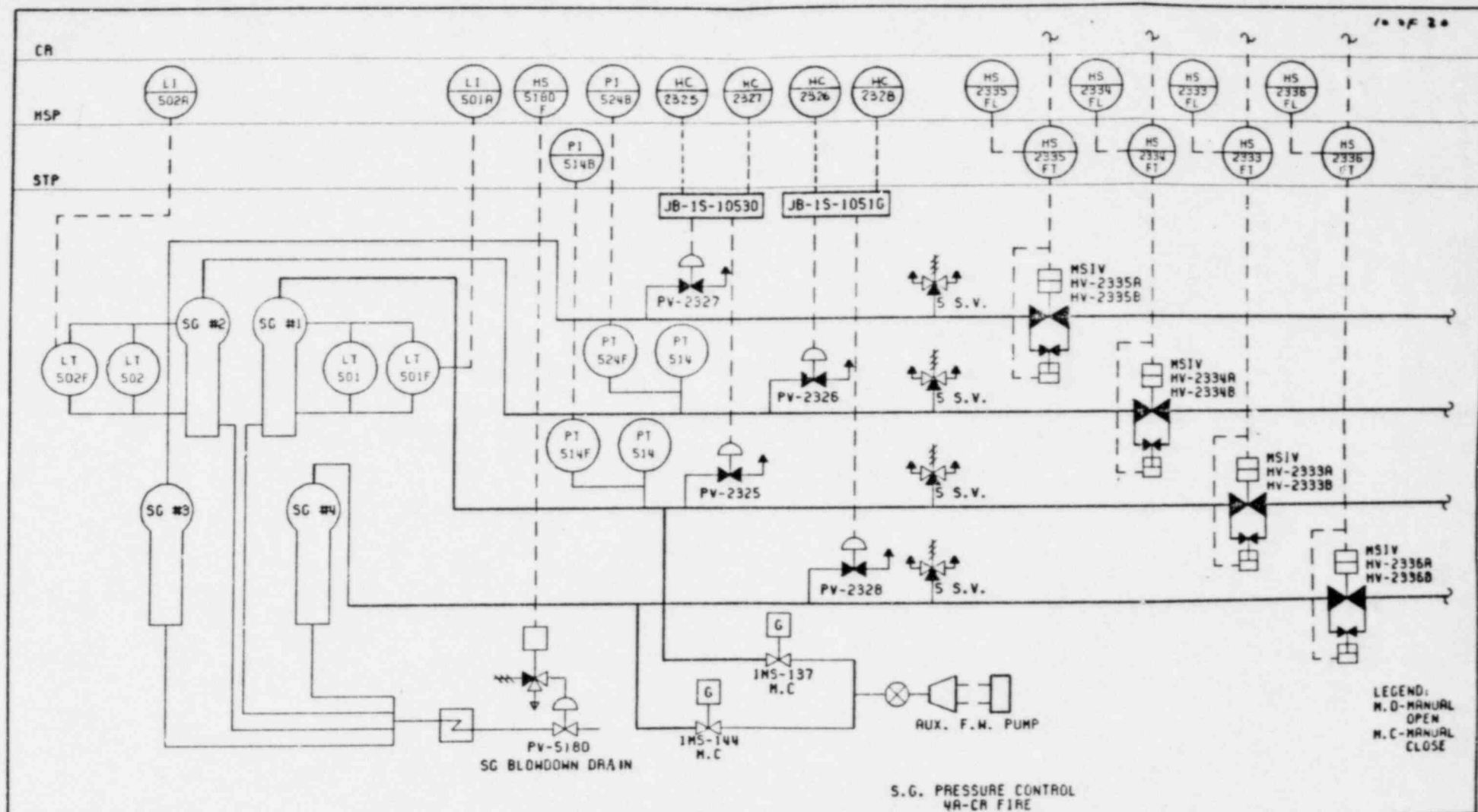



S.G. INVENTORY CONTROL
3C - STP FIRE

										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
														MINI P & ID 3C	
FIRE PROTECTION ANALYSIS															
ISSUED FOR															
ISSUE NO.	DATE	DWN.	CHRD.	SQUAD LDR	ISC	MECH	NUCLEAR	ELEC	P.E.						

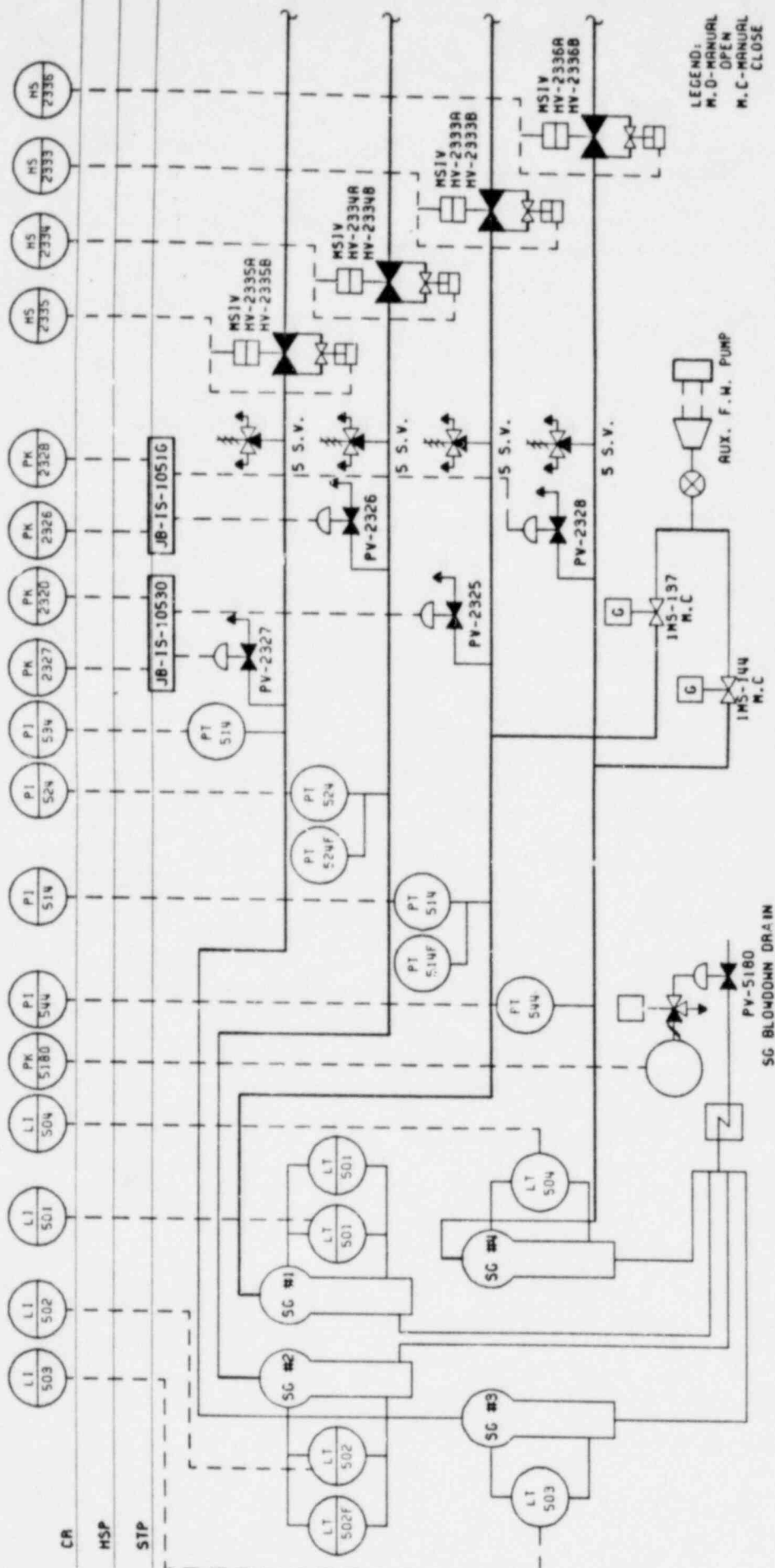
JOB NO. 11-2323-025

CRORE (9929-2929)



						COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323	
										MINI P & ID 4A	
A WED						FIRE PROTECTION ANALYSIS				SHEET NO.	
ISSUE NO.		DATE	OWN.	CHNG.	SOURC. LDR.	14C MECH NUCLEAR ELEC P.E.		ISSUED FOR		CR PIPE SG. PRESS.	

LI	503	LI	502	LI	501	LI	504	PK	5180	PI	544	PI	519	PI	524	PI	534	PK	2327	PK	2320	PK	2326	PK	2328	HS	2335	HS	2334	HS	2333	HS	2336
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LEGEND:
M.O-MANUAL
OPEN
M.C-MANUAL
CLOSE

S.G. PRESSURE CONTROL
48-HSP & STP FIRE

[illegible]

MCPS SEAL, INTEGRITY, NEUTRALITY CONTROLS
4 PCS INVENTORY CONTROLS
SAP - CONTROL ROOM FINE

BURNS OFFSHORE SERVICES INC. 10000 150th Ave Burnsville, MN 55337 612-251-1000	10000 150th Ave Burnsville, MN 55337 612-251-1000
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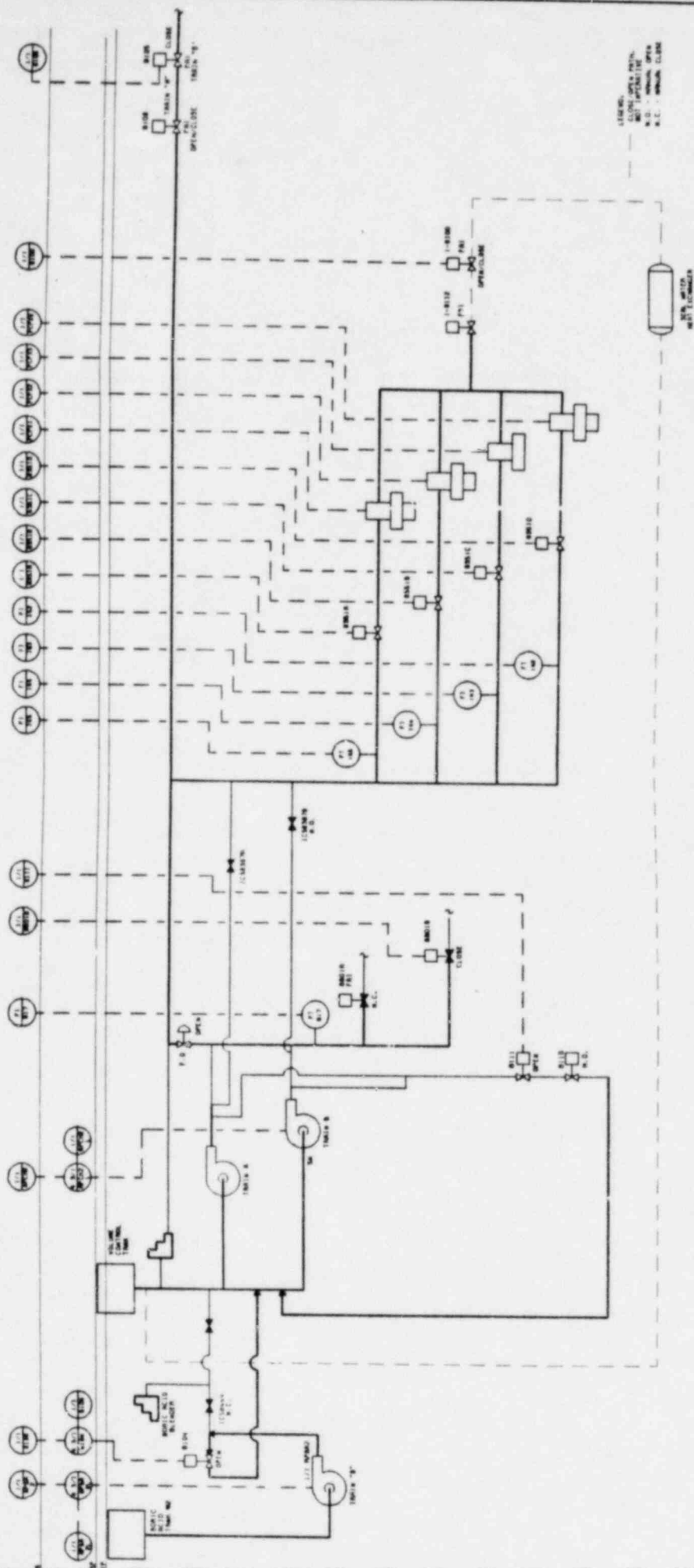
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[illegible][illegible]

100

DATE	TIME
10-10-1968	10:00 AM



W.P. SELL, UNIVERSITY, NEW JERSEY CONTRACT
A. P. SELL, UNIVERSITY, NEW JERSEY CONTRACT

C.I. 1940		C.I. 1950	
Year	Population	Year	Population
1940	1,000,000	1950	1,500,000
1950	1,500,000	1960	2,000,000
1960	2,000,000	1970	2,500,000
1970	2,500,000	1980	3,000,000
1980	3,000,000	1990	3,500,000
1990	3,500,000	2000	4,000,000

[illegible]

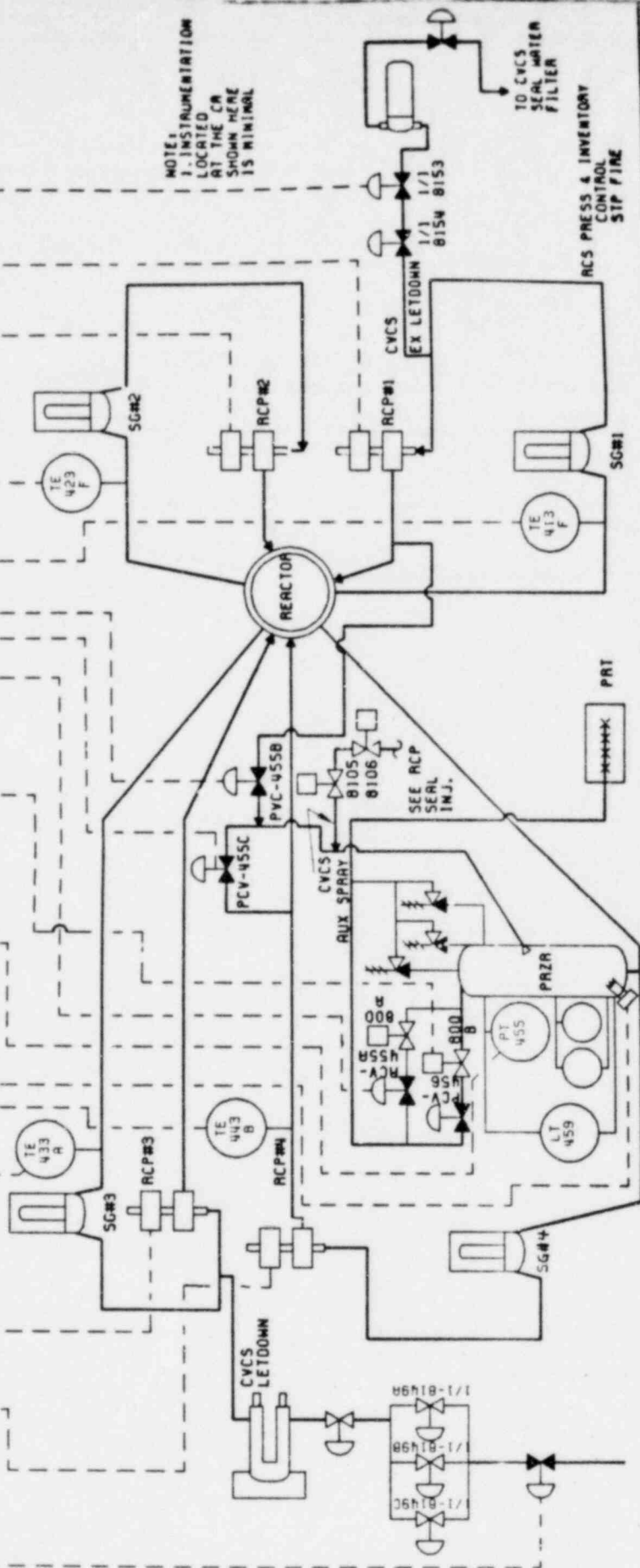
ISSUED FOR

Goss & Hall, Inc.
9-40-2000, 10-40-2000, 11-40-2000, 12-40-2000

RCS PRESS & INVENTORY
CONTROL CSA/CR FIRE

MINI P 4 10
68

NOTE:
1. INSTRUMENTATION
LOCATED
AT THE CA
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IS MINIMAL



COMANCHE PEAK S.E.S.
1960-82-2300 MI: INSTALLATION

Case & Hill, Inc.
20-25 West, Chicago 4, Ill. CD-6714, C-1038

TEXAS UTILITIES SERVICES INC.

AGENT FOR

DALLAS POWER & LIGHT COMPANY

TEXAS ELECTRIC SERVICE COMPANY

TEXAS POWER & LIGHT COMPANY

ICS PRESS & INVENTORY
CONTROL CSA/CA FIRE

JOB NO. 2323

MINI P & 10

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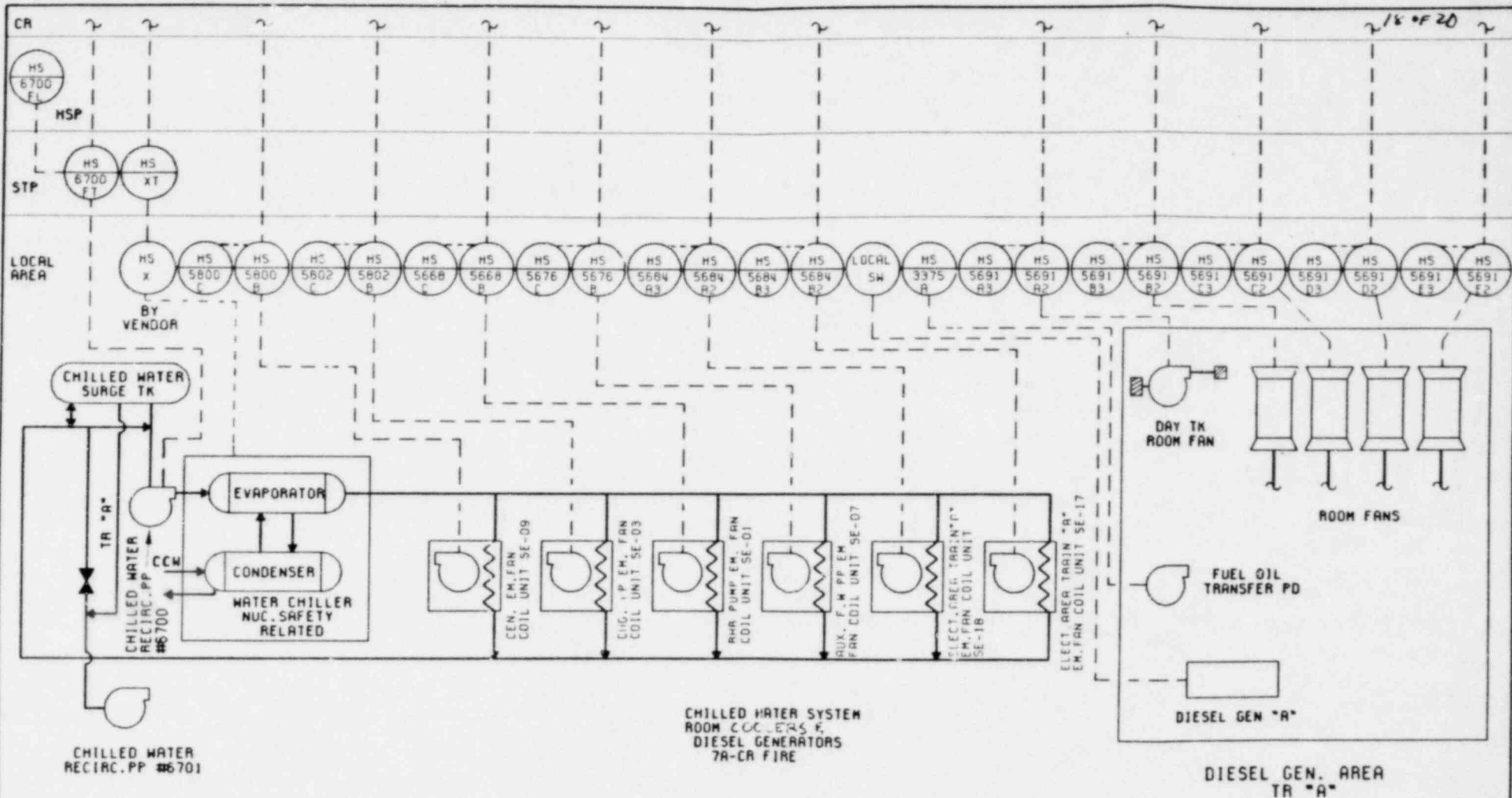
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ISSUE DATE	DATE	CHRGD.	STATUS	INAC	MECH	NUCLEAR	ELEC	P. E.	ISSUED FOR
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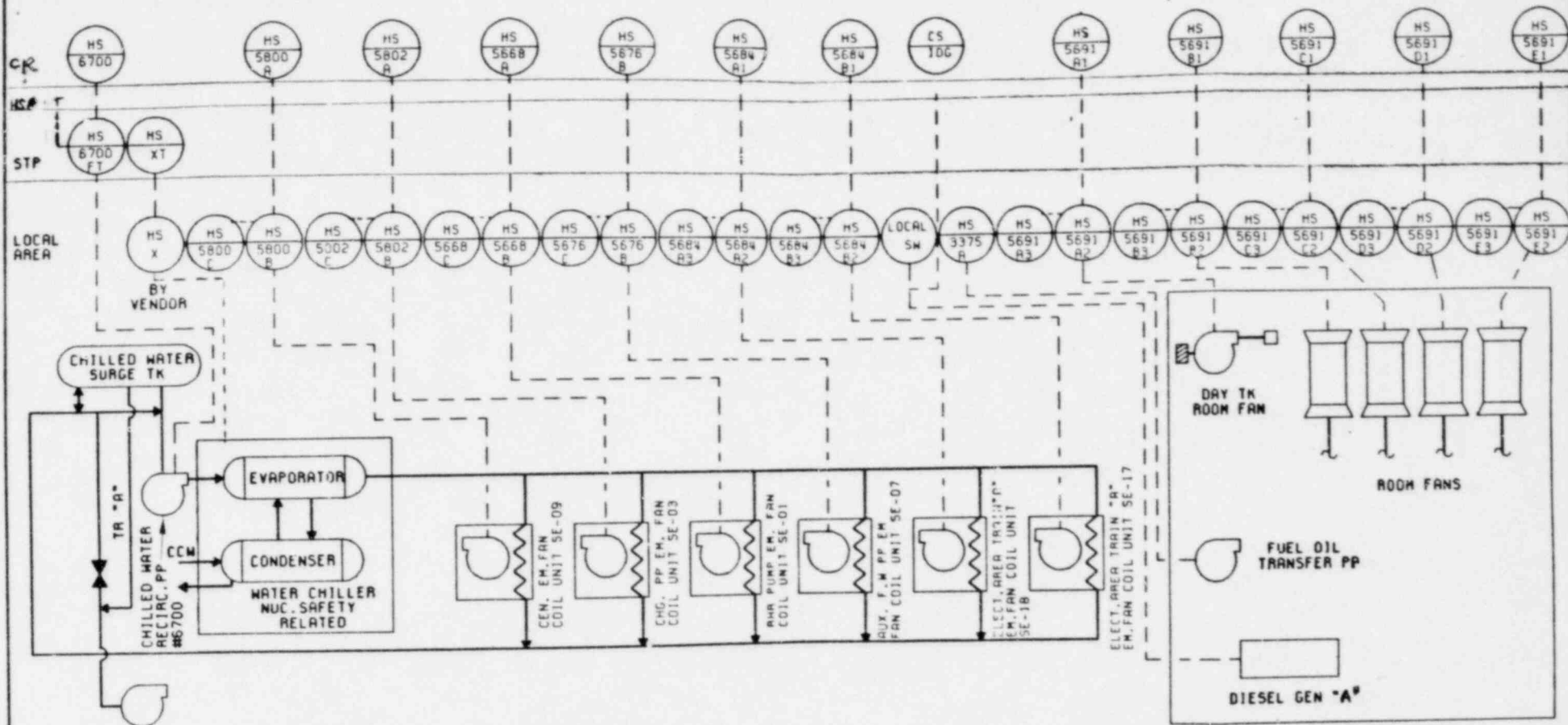
108 NO. 11-2323-025

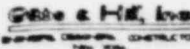


				COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION				TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY				JOB NO. 2323			
												MINI P & ID 7A			
GC												SHEET NO.			
ISSUE NO.	DATE	OWN.	CHRG.	SOUND LDR	14C	MECH	NUC.	EAM	ELEC	P.E.	ISSUED FOR	CHILLED WATER SYSTEM EM. DIESEL GEN. & A CR FIRE			

JOB NO. 11-2329-035

DATE: 8/11/81

CHILLED WATER
RECIRC. PP #6700CHILLED WTR. SYSTEM ROOM COOLING & DIESEL GENERATORS
HSP FIREDIESEL GEN. AREA
TR "A"

										COMANCHE PEAK S.E.S. 1980-82-2300 MW INSTALLATION		TEXAS UTILITIES SERVICES INC. AGENT FOR DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY		JOB NO. 2323
														MINI P & ID 7B
												CHILLED WATER SYSTEM EM. DIESEL GEN. & A CR FIRE		SHEET NO.
ME										ISSUED FOR				
ISSUE NO.	DATE	OWN.	CHRG.	SQUAD LDR	JAC	MECH	NUCLEAR	ELEC	P.E.	ISSUED FOR		JOB NO. 11-2323-025		CADRE/BS23.2321

