PARSONS POWER

Critical Design Characteristics

Overcooling Events

Millstone 2

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Revision 0

TABLE OF CONTENTS

ATTACHMENT 1
OVERCOOLING EVENTS CRITICAL DESIGN CHARACTERISTICS

1.0 INCREASE IN HEAT REMOVAL BY THE SECONDARY SYSTEM

1.1 Five design basis events (DBEv's) are considered in section 14.1 of the FSAR. The applicability of each accident for each plant operating mode, and whether an analysis was performed by NNECo, is presented in Figure 1.

Figure 1: Tier-2 AMSR - Overcooling Events

Plant Oper. Mode	14.1.1 Decrease in Feedwater Temperature	14.1.2 Increase in Feedwater Flow	14.1.3 Increase in Steam flow	14.1.4 Steam Generator Relief Valve Opening	14.1.5 Main Steam Line Break (MSLB)
1	14.1.3	14.1.3	**Analyze**	14.1.3	**Analyze**
2	14.1.3	Mode 3	Mode 1	14.1.3	**Analyze**
3	14.1.3	14.1.3	**Analyze**	14.1.3	Mode 2
4	N/A	14.1.3	Mode 3	14.1.3	Mode 2
5	N/A	14.1.3	Mode 3	N/A	Mode 2
6	N/A	14.1.3	Mode 3	N/A	Mode 2

Analyze - The DBEv was analyzed, by NNECo, for the listed operating mode and the results summarized in FSAR section 14.1.
Mode "n" - The DBEv is bounded by the mode "n" case ("n" = 1 - 6).
14.1.3 - The DBEv is bounded by another event, in this case by event 14.1.3.
N/A - The DBEv is not applicable for the listed operating mode.

1.2 The AMSR Program will "review" the DBEv's listed as "Analyze" in Figure 1. These are:

DBEv 14.1.3 Mode 1 - 10% increase in steam flow at full power (limiting case).
DBEv 14.1.3 Mode 3 - 41% increase in steam flow at Hot Zero Power, equivalent to rapid opening of the steam dump and turbine bypass valves.
DBEv 14.1.5 Mode 1 - MSLB @ Hot Full Power (HFP) offsite power available,
DBEv 14.1.5 Mode 1 - MSLB @ Hot Full Power (HFP) coincident with a loss of offsite power,
DBEv 14.1.5 Mode 2 - MSLB @ Hot Zero Power (HZP) offsite power available,
DBEv 14.1.5 Mode 2 - MSLB @ Hot Zero Power (HZP) coincident with a loss of offsite power.

1.3 Figure 2 shows the systems involved in the mitigation of each analyzed overcooling event.

Figure 2: Tier-2 AMSR - Systems Involved in Overcooling Events

SYSTEM	14.1.2 Increase in Steam Flow Mode 1	14.1.2 Increase in Steam Flow Mode 3	14.1.5 MSLB Mode 1	14.1.5 MSLB w/LOOP Mode 1	14.1.5 MSLB Mode 2	14.1.5 MSLB w/LOOP Mode 2
RPS	X	X	X	X	X	X
CEDM	X	X	X	X	X	X
RCS			X	X	X	X
TURB	X	X	X	X		
EHC	X	X	X	X		
MS	X	X	X	X	X	X
MFW			X	X		
AFW			X	X	X	X
CVCS			X	X	X	X
HPSI			X	X	X	X
ELECT DIST	X	X	X	X	X	X
EDG				X		X

1.4 Figure 3 shows the Which Critical Safety Functions have corresponding Critical Design Characteristics for each of the analyzed accidents.

Figure 3: Tier-2 AMSR - Critical Safety Functions with CDCs in Overcooling Events

Critical Safety Function	14.1.2 Increase in Steam Flow Mode 1	14.1.2 Increase in Steam Flow Mode 3	14.1.5 MSLB Mode 1 (4 Cases)
Reactivity	X	X	X
Fuel Integrity	X	X	X
RCS Heat Removal	X	X	X
RCS Pressure & Inventory	*	*	*
Containment Integrity & Radiation Control			
Electrical Power	X	X	X
Essential Support Systems			
Environmental Control			

* To be determined from detailed analyses

1.5 The analyzed event duration, Minimum Departure from Nucleate Boiling Ratio (MDNBR) and Maximum Linear Heat Generation Rate (Max LHGR), as documented in FSAR chapter 14 for each analyzed event, are presented in Figure 4.

Figure 4: Tier-2 AMSR - Overcooling Events Analysis Results

FSAR SECTION 14.1 ANALYZED DESIGN BASIS EVENT	Analyzed Duration (sec)	MDNBR	Max LHGR
DBEv 14.1.3 Mode 1 - 10% increase in steam flow at HFP	43	1.21	19.3
DBEv 14.1.3 Mode 3 - 41% increase in steam flow at HZP	*	*	*
DBEv 14.1.5 Mode 1 - MSLB @ HFP offsite power available	600	3.00	17.1
DBEv 14.1.5 Mode 1 - MSLB @ HFP & loss of offsite power	600	4.6	5.7
DBEv 14.1.5 Mode 2 - MSLB @ HZP offsite power available	600	2.4	20.99
DBEv 14.1.5 Mode 2 - MSLB @ HZP & loss of offsite power	600	1.18	16.5

* Results not available in FSAR section 14.1.3

1.6 Critical Design Characteristics Development Method

The following method was used to develop the overcooling event CDCs. Five (5) overcooling events are described in section 14.1 of the FSAR. Each event was reviewed and design inputs extracted. Each design input was assigned to one or more Critical Safety Functions (CSFs). The CSF diagrams were then used to develop functional/system level CDCs for each event.

1.7 System Boundary Diagrams

System Boundary Diagrams (SBDs) are developed for each accident mitigation system. Using the SBDs, the AMSR Program Team will identify the system configuration and component actions required to meet the system/functional CDCs. This information will be loaded into the Tier-2 Data Base and will constitute the Chapter 14 requirement at the component level.

1.8 CDC Validation

The CDCs will be validated "as present" in the installed plant configuration. The validation method will be determined following review of the detailed analyses supporting the FSAR Charpter 14 events. Millstone-2 system and component test data will be used to the maximum extent possible to perform this validation. When CDCs cannot be validated by test, then analysis or alternate means will be used to perform the validation.

2.0 CRITICAL DESIGN CHARACTERISTICS

A discussion of each FSAR section 14.1 DBEv, and the functional/system CDC listing, are presented in sections 2.1 through 2.5 of this attachment. These CDCs will be augmented with information derived from FSAR Chapter 6, 7, 8 and 9, and the detailed analyses and calculations that support FSAR Chapter 14.

2.1 DECREASE IN FEEDWATER TEMPERATURE

2.1.1 EVENT DESCRIPTION

The decrease in feedwater temperature event is discussed in FSAR section 14.1.1. The event can be caused by loss of one or more feedwater heaters. This can occur due to a loss of extraction steam or due to heater bypass. The worst case loss of feedwater heaters would occur if the low pressure heaters were bypassed. The most limiting case is from rated power.

2.1.2 DESIGN BASIS

N/A - Bounded by event 14.1.3

2.1.3 SYSTEM INTERFACE

N/A - Bounded by event 14.1.3

2.1.4 EVENT DISPOSITION

This event is bounded by the Increase in Steam Flow Event discussed in FSAR Section 14.1.3, and thus is not analyzed.

2.1.5 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.1: DECREASE IN FEEDWATER TEMPERATURE

This event is bounded by event 14.1.3. Therefore, no functional/system level CDCs are identified.

2.2 INCREASE IN FEEDWATER FLOW

2.2.1 EVENT DESCRIPTION

The increase in feedwater flow event is discussed in FSAR section 14.1.2. The event is initiated by a failure in the feedwater system which causes an increase in feedwater flow to the steam generators. The limiting consequences of the increase in feedwater flow will occur at rated power conditions and will bound all other power operating conditions due to the initial steam generator inventory and initial margin to DNB. The largest cooldown which can be postulated due to feedwater addition at full power is the inadvertent startup of all three AFW pumps. This cooldown rate is less than that calculated for event 14.1.3, Increase in Steam Flow, and thus is bounded by that event.

2.2.2 DESIGN BASIS

N/A - Bounded by event 14.1.3

2.2.3 SYSTEM INTERFACE

N/A - Bounded by event 14.1.3

2.2.4 EVENT DISPOSITION

This event is bounded by the Increase in Steam Flow Event discussed in FSAR Section 14.1.3.

2.2.5 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.1: INCREASE IN FEEDWATER FLOW

This event is bounded by event 14.1.3. Therefore, no functional/system level CDCs are identified.

2.3 INCREASE IN STEAM FLOW

2.3.1 EVENT DESCRIPTION

This event is initiated by a failure or misoperation in the main steam system which results in an increase in steam flow from the steam generators. The simultaneous opening of the condenser dump and turbine bypass valves could result in a steam load increase of 41% above full rated load. The consequences of this event for all other power operating conditions, including Mode 2, are bounded by the rated power operating conditions. The Mode 3 condition bounds modes 4 - 6 for "zero power" initial conditions. This energy removal rate also bounds the rated power operating conditions for events 14.1.1, 14.1.2 and 14.1.4.

2.3.2 DESIGN BASIS

The MNPS-2 Increase in Steam Flow analysis is based on the following primary assumptions:

a. Most reactive control rod stuck in its fully withdrawn position.
   Reference: FSAR Section 14.0.6
b. Single failure criteria for offsite power case is (to be determined)
c. Single failure criteria for LOOP case does not apply.

2.3.3 SYSTEM INTERFACE

The following systems interface during this event:

a. Main Steam
b. Control Element Drive
c. Reactor Protection System
d. Turbine Generator (Turbine Stop Valves)
e. Electro-Hydraulic Control System
f. Electrical Distribution

2.3.4 EVENT DISPOSITION

Two cases are analyzed. For Mode 1, the limiting event is a 10% increase in steam load initiated from full power. This event is mitigated by reactor and turbine trip. For Mode 3, the limiting event is a rapid opening of both the atmospheric dump turbine bypass valves resulting in a steam flow equal to 41% of full rated load. The event sequence is not included in the FSAR.

2.3.5 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.3: INCREASE IN STEAM FLOW (Mode 1)

The Critical Design Characteristics for the Increase in Steam Flow Event, Mode 1, are presented below.

2.3.5.1 REACTIVITY CONTROL CSF

Functional/System CDCs - Insert control rods.
Reference: FSAR Table 14.1.3-3

2.3.5.2 FUEL INTEGRITY & CORE HEAT REMOVAL CSF

Functional/System CDCs - Included with RCSHR CSF.

2.3.5.3 RCS HEAT REMOVAL CSF

Functional/System CDCs - Trip turbine to reduce the steaming rate.
Reference: FSAR Table 14.1.3-3

2.3.5.4 RCS PRESSURE & INVENTORY CONTROL

Functional/System CDCs - Identify from event detailed analyses, if applicable

2.3.5.5 CONTAINMENT INTEGRITY & RADIATION CONTROL CSF

Functional/System CDCs - N/A for this event.

2.3.5.6 ELECTRICAL POWER CSF

Functional/System CDCs - Transfer loads to offsite power source.

2.3.5.7 ESSENTIAL SUPPORT SYSTEMS CSF

Functional/System CDCs - N/A for this event.

2.3.5.8 ENVIRONMENTAL CONTROL CSF

Functional/System CDCs - N/A for this event

2.3.6 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.3: INCREASE IN STEAM FLOW (Mode 3)

The Critical Design Characteristics for the Increase in Steam Flow Event, Mode 3, are presented below.

2.3.6.1 REACTIVITY CONTROL CSF

Functional/System CDCs - Identify from event detailed analyses

2.3.6.2 FUEL INTEGRITY & CORE HEAT REMOVAL CSF

Functional/System CDCs - Included with RCSHR CSF.

2.3.6.3 RCS HEAT REMOVAL CSF

Functional/System CDC - Steam flow limited to 41%
Reference: FSAR Section 14.1.3.6

2.3.6.4 RCS PRESSURE & INVENTORY CONTROL

Functional/System CDCs - Identify from event detailed analyses, if applicable

2.3.6.5 CONTAINMENT INTEGRITY & RADIATION CONTROL CSF

Functional/System CDCs - N/A for this event.

2.3.6.6 ELECTRICAL POWER CSF

Functional/System CDCs - Plant loads power from offsite power source which is maintained through out event. No additional functional/system CDCs.

2.3.6.7 ESSENTIAL SUPPORT SYSTEMS CSF

Functional/System CDCs - N/A for this event.

2.3.6.8 ENVIRONMENTAL CONTROL CSF

Functional/System CDCs - N/A for this event

2.4 INADVERTENT OPENING OF A STEAM GENERATOR RELIEF OR SAFETY VALVE

2.4.1 EVENT DESCRIPTION

This event is initiated by an increase in steam flow caused by the inadvertent opening of a secondary side safety or relief valve. The inadvertent opening of a steam generator safety valve would result in an increased steam flow of approximately 6.75% of full rated steam flow. This event is bounded by event 14.1.3, which analyzes steam flow increases of 10% and greater. See discussion in section 1.3 above.

2.4.2 DESIGN BASIS

N/A - Bounded by event 14.1.3 (Relief valve capacity <10% full rated flow)

2.4.3 SYSTEM INTERFACE

N/A - Bounded by event 14.1.3

2.4.4 EVENT DISPOSITION

This event is bounded by the Increase in Steam Flow Event discussed in FSAR Section 14.1.3, and thus is not analyzed. However, a functional/system level critical characteristic is appropriate. That is, to validate that the steam generator relief valve capacity is less than the 10% assumed in the event 14.1.3 analysis.

2.4.5 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.4: INADVERTENT OPENING OF A STEAM GENERATOR RELIEF OR SAFETY VALVE

The Critical Design Characteristics for the Inadvertent Opening of a Steam Generator Relief or Safety Valve Event are presented below.

2.4.5.1 RCS HEAT REMOVAL CSF

Functional/System CDCs - Steam generator relief valve capacity is limited to 10% of full rated steam flow. Reference: FSAR sections 14.1.4.4 and 14.1.3.6.

2.4.5.2 Functional/System CDCs do not apply for the other 7 critical safety functions.

2.5 MAIN STEAM LINE BREAK (MSLB) ACCIDENT, RCS ANALYSIS

2.5.1 EVENT DESCRIPTION

This event is initiated by a rupture in the main steam piping upstream of the MSIVs which results in an uncontrolled steam release from the secondary system. The increase in energy removal through the secondary system results in severe overcooling of the primary system. In the presence of a negative Moderator Temperature Coefficient (MTC), this cooldown causes a decrease in the shutdown margin (following reactor trip) such that a return to power might be possible following a steam line rupture assuming that the most reactive control rod is stuck in its fully withdrawn position. The MNPS-2 limiting MSLB from a safety standpoint is a Hot Zero Power (HZP) double-ended guillotine break inside containment between the steam generator and the flow restrictors. The MNPS-2 MSLB-RCS analysis is described in FSAR Section 14.1.5.

2.5.2 DESIGN BASIS

The MNPS-2 MSLB-RCS [illegible] the following primary assumptions:

a. Most reactive cont[illegible] hdrawn position.
   Reference: FSAR [illegible]
b. Single failure cr[illegible]ria for [illegible] loss of one HPSI pump and one charging pump.
   Reference: FSAR Section [illegible]3, and Table 14.1.5-3.
c. Single failure criteria for LOOP [illegible]ne diesel generator, resulting in the loss of one HPSI pump and one charging pump.
   Reference: FSAR Section 14.1.5.4, 14.1.5.5.1.3, and Table 14.1.5-3
d. Safety injection actuation signal (SIAS) actuated by low pressurizer pressure.
e. Secondary isolation signal (MSI) actuated by low steam pressure.

2.5.3 SYSTEM INTERFACE

The following systems interface during the postulated MSLB-RCS recovery analysis:

a. Reactor Protection System
b. Control Element Drive
c. Reactor Coolant System
d. Turbine
e. Electro-Hydraulic Control
f. Main Steam
g. Main Feedwater System (hot full power case)
h. Auxiliary Feedwater
i. Chemical & Volume Control System
j. High Pressure Safety Injection
k. Electrical Distribution
l. Emergency Power System (loss of offsite power case)

2.5.4 EVENT DISPOSITION

The limiting break is a double-ended guillotine break inside containment between SG and flow restrictors. Two modes are analyzed. For mode 2, the limiting case is with the reactor just critical.

The mode 2 analysis is performed with offsite power available and also concurrent with a loss of offsite power. For mode 1, the limiting case is with the reactor at full rated power. The mode 1 analysis is performed with offsite power available and also concurrent with a loss of offsite power.

2.5.5 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.5.6.1: MSLB @ HZP

The Critical Design Characteristics for the MSLB Event @ HZP, with offsite power available, are presented below.

2.5.5.1 REACTIVITY CONTROL CSF

Functional/System CDC - Insert control rods within 3.9 seconds of reaching reactor trip setpoint.
Reference: FSAR Table 14.1.5-4

Functional/System CDC - Inject boron to limit peak power.
Reference: FSAR Table 14.1.5-7
Note: HPSI and charging pump actuation times included under RCS Pressure & Inventory CSF.

Functional/System CDC - Inject boron to achieve core subcritical condition beyond 600 seconds.
Reference: FSAR Table 14.1.5-7

2.5.5.2 FUEL INTEGRITY & CORE HEAT REMOVAL CSF - Functional/System CDCs included in 2.5.5.3 and 2.5.5.4 below.

2.5.5.3 RCS HEAT REMOVAL CSF

Functional/System CDC - Close MSIV on intact main steam line to limit cooldown from non-affected steam generator blowdown. Reference: FSAR Table 14.1.5-7

Functional/System CDC - Limit AFW flow to affected steam generator for first 180 seconds of event.
Reference: FSAR Section 14.1.5.5.1.4

Functional/System CDC - Isolate AFW flow to affected steam generator at 600 seconds.
Reference: FSAR Table 14.1.5-7

2.5.5.4 RCS PRESSURE & INVENTORY CONTROL CSF

Functional/System CDC - Initiate HPSI flow per design basis HPSI pump head curve.
Reference: FSAR Table 14.1.5-7

Functional/System CDC - initiate charging flow per design basis pump capacity.
Reference FSAR Table 14.1.5-7

2.5.5.5 CONTAINMENT INTEGRITY & RADIATION CONTROL CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.5.6 ELECTRICAL POWER CSF - Plant loads power from offsite power source which is maintained through out event. No additional functional/system CDCs.

2.5.5.7 ESSENTIAL SUPPORT SYSTEMS CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.5.8 ENVIRONMENTAL CONTROL CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.6 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.5.6.2: MSLB @ HZP w/LOOP

The Critical Design Characteristics for the MSLB Event @ HZP, with a loss of offsite power, are presented below.

2.5.6.1 REACTIVITY CONTROL CSF

Functional/System CDC - (Similar to event 14.1.5.6.1) Insert control rods within 3.9 seconds of reaching reactor trip setpoint.
Reference: FSAR Table 14.1.5-4

Functional/System CDC - (Similar to event 14.1.5.6.1) Inject boron to limit peak power.
Reference: FSAR Table 14.1.5-8

Functional/System CDC - (Similar to event 14.1.5.6.1) Inject boron to achieve core subcritical condition beyond 600 seconds.
Reference: FSAR Table 14.1.5-8

2.5.6.2 FUEL INTEGRITY & CORE HEAT REMOVAL CSF

Functional/System CDCs included in 2.5.6.3 and 2.5.6.4 below.

2.5.6.3 RCS HEAT REMOVAL CSF

Functional/System CDC - (Similar to event 14.1.5.6.1) Close MSIV on intact main steam line to limit cooldown from non-affected steam generator blowdown. Reference: FSAR Table 14.1.5-8

Functional/System CDC - Limit AFW flow to affected steam generator for first 180 seconds of event.
Reference: FSAR Section 14.1.5.5.1.4

Functional/System CDC - Isolate AFW flow to affected steam generator at 600 seconds.
Reference: FSAR Table 14.1.5-7

2.5.6.4 RCS PRESSURE & INVENTORY CONTROL CSF

Functional/System CDC - (Similar to event 14.1.5.6.1) Initiate HPSI flow per design basis HPSI pump head curve.
Reference: FSAR Table 14.1.5-8

Functional/System CDC - (Similar to event 14.1.5.6.1) initiate charging flow per design basis pump capacity.
Reference FSAR Table 14.1.5-8

2.5.6.5 CONTAINMENT INTEGRITY & RADIATION CONTROL CSF

RCS analysis only. No applicable functional/system CDCs.

2.5.6.6 ELECTRICAL POWER CSF

Functional/System CDC - Diesel Generator start and load to supply power to HPSI, charging, and AFW pumps.

2.5.6.7 ESSENTIAL SUPPORT SYSTEMS CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.6.8 ENVIRONMENTAL CONTROL CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.7 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.5.6.3: MSLB @ HFP

The Critical Design Characteristics for the MSLB Event @ HFP, with offsite power available, are presented below.

2.5.7.1 REACTIVITY CONTROL CSF

Functional/System CDC - (Similar to Event 14.1.5.6.1) Insert control rods within 3.9 seconds of reaching reactor trip setpoint.
Reference: FSAR Table 14.1.5-4

Functional/System CDC - Inject boron to limit peak power.
Reference: FSAR Table 14.1.5-9
Note: HPSI and charging pump actuation times included under RCS Pressure & Inventory CSF.

Functional/System CDC - Inject boron to achieve core subcritical condition beyond 600 seconds.
Reference: FSAR Table 14.1.5-9

2.5.7.2 FUEL INTEGRITY & CORE HEAT REMOVAL CSF

Functional/System CDCs included in 2.5.7.3 and 2.5.7.4 below.

2.5.7.3 RCS HEAT REMOVAL CSF

Functional/System CDC - (Similar to Event 14.1.5.6.1) Close MSIV on intact main steam line to limit cooldown from non-affected steam generator blowdown. Reference: FSAR Table 14.1.5-9

Functional/System CDC - FW flow limited to that allowed by secondary pressure decrease for the first 30 seconds of the event.
Reference: FSAR Section 14.1.5.5.1.4

Functional/System CDC - Isolate FW flow 30 seconds after the reactor trip.

Functional/System CDC - (Similar to Event 14.1.5.6.1) AFW flow initiated at runout value at t=180 sec.
Reference: FSAR Section 14.1.5.5.1.4

Functional/System CDC - (Similar to Event 14.1.5.6.1) Isolate AFW flow to affected steam generator at 600 seconds.
Reference: FSAR Table 14.1.5-9

2.5.7.4 RCS PRESSURE & INVENTORY CONTROL CSF

Functional/System CDC - (Similar to Event 14.1.5.6.1) Initiate HPSI flow per design basis HPSI pump head curve.
Reference: FSAR Table 14.1.5-9

Functional/System CDC - (Similar to Event 14.1.5.6.1) initiate charging flow per design basis pump capacity.
Reference FSAR Table 14.1.5-9

2.5.7.5 CONTAINMENT INTEGRITY & RADIATION CONTROL CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.7.6 ELECTRICAL POWER CSF

Functional/System CDC - Transfer loads to offsite power source.

2.5.7.7 ESSENTIAL SUPPORT SYSTEMS CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.7.8 ENVIRONMENTAL CONTROL CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.8 FUNCTIONAL/SYSTEM CDCs - EVENT 14.1.5.6.4: MSLB @ HFP w/LOOP

The Critical Design Characteristics for the MSLB Event @ HFP, with a loss of offiste power, are presented below.

2.5.8.1 REACTIVITY CONTROL CSF

Functional/System CDC - **(Similar to Event 14.1.5.6.1)** Insert control rods within 3.9 seconds of reaching reactor trip setpoint.
Reference: FSAR Table 14.1.5-4

Functional/System CDC - Inject boron to limit peak power.
Reference: FSAR Table 14.1.5-10
Note: HPSI and charging pump actuation times included under RCS Pressure & Inventory CSF.

Functional/System CDC - Inject boron to achieve core subcritical condition beyond 600 seconds.
Reference: FSAR Table 14.1.5-10

2.5.8.2 FUEL INTEGRITY & CORE HEAT REMOVAL CSF

- Functional/System CDCs included in 2.5.8.3 and 2.5.8.4 below.

2.5.8.3 RCS HEAT REMOVAL CSF

Functional/System CDC - **(Similar to Event 14.1.5.6.1)** Close MSIV on intact main steam line to limit cooldown from non-affected steam generator blowdown. Reference: FSAR Table 14.1.5-10

Functional/System CDC - FW flow limited to that allowed by secondary pressure decrease for the first 30 seconds of the event.
Reference: FSAR Section 14.1.5.5.1.4

Functional/System CDC - Isolate FW flow 30 seconds after the reactor trip.

Functional/System CDC - **(Similar to Event 14.1.5.6.1)** AFW flow initiated at runout value at t=180 sec.
Reference: FSAR Section 14.1.5.5.1.4

Functional/System CDC - **(Similar to Event 14.1.5.6.1)** Isolate AFW flow to affected steam generator at 600 seconds.
Reference: FSAR Table 14.1.5-10

2.5.8.4 RCS PRESSURE & INVENTORY CONTROL CSF

Functional/System CDC - **(Similar to Event 14.1.5.6.1)** Initiate HPSI flow per design basis HPSI pump head curve.
Reference: FSAR Table 14.1.5-10

Functional/System CDC - **(Similar to Event 14.1.5.6.1)** initiate charging flow per design basis pump capacity.
Reference FSAR Table 14.1.5-10

2.5.8.5 CONTAINMENT INTEGRITY & RADIATION CONTROL CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.8.6 ELECTRICAL POWER CSF

Functional/System CDC - (Similar to Event 14.1.5.6.2) Diesel Generator start and load to supply power to HPSI, charging, and AFW pumps.

2.5.8.7 ESSENTIAL SUPPORT SYSTEMS CSF - RCS analysis only. No applicable functional/system CDCs.

2.5.8.8 ENVIRONMENTAL CONTROL CSF - RCS analysis only. No applicable functional/system CDCs.

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Critical Safety Function Diagrams

Millstone Unit 2

TABLE OF CONTENTS

ATTACHMENT 2
CRITICAL SAFETY FUNCTIONS

1. REACTIVITY CONTROL
Trip the reactor and maintain the reactor core shutdown margin within Technical Specification Limits.

2. FUEL INTEGRITY & CORE HEAT REMOVAL
Maintain core cooling to prevent fuel cladding failure and release of fission products to the reactor coolant system. The core should remain covered and reactor coolant subcooling margin maintained > 30 degF.

3 RCS HEAT REMOVAL
Utilize the steam generators as an RCS heat sink. $Qrx = Qsg = Usg\ Asg\ (Tave - Tsat)$

Deliver reactor core heat output (Qrx) to the steam generators via forced flow or natural circulation.
Maintain steam generator water level to provide sufficient wetted tube area (Asg) for primary to secondary heat transfer.
Control steam generator pressure (and thereby Tsat) to maintain the steam generator as an RCS heat sink.
Control steam generator pressure to control RCS temperature (Tave) and its rate/direction of change.

4. RCS PRESSURE & INVENTORY CONTROL
Maintain RCS pressure within the limits of EOP Figure 3.2 (RCS Pressure/Temperature Limits) for the given RCS temperature by use of a pressurizer steam bubble (preferred method) or emergency injection system throttling and CVCS/relief valve operation.
Maintain RCS inventory sufficient to ensure core heat removal and primary to secondary heat transfer.

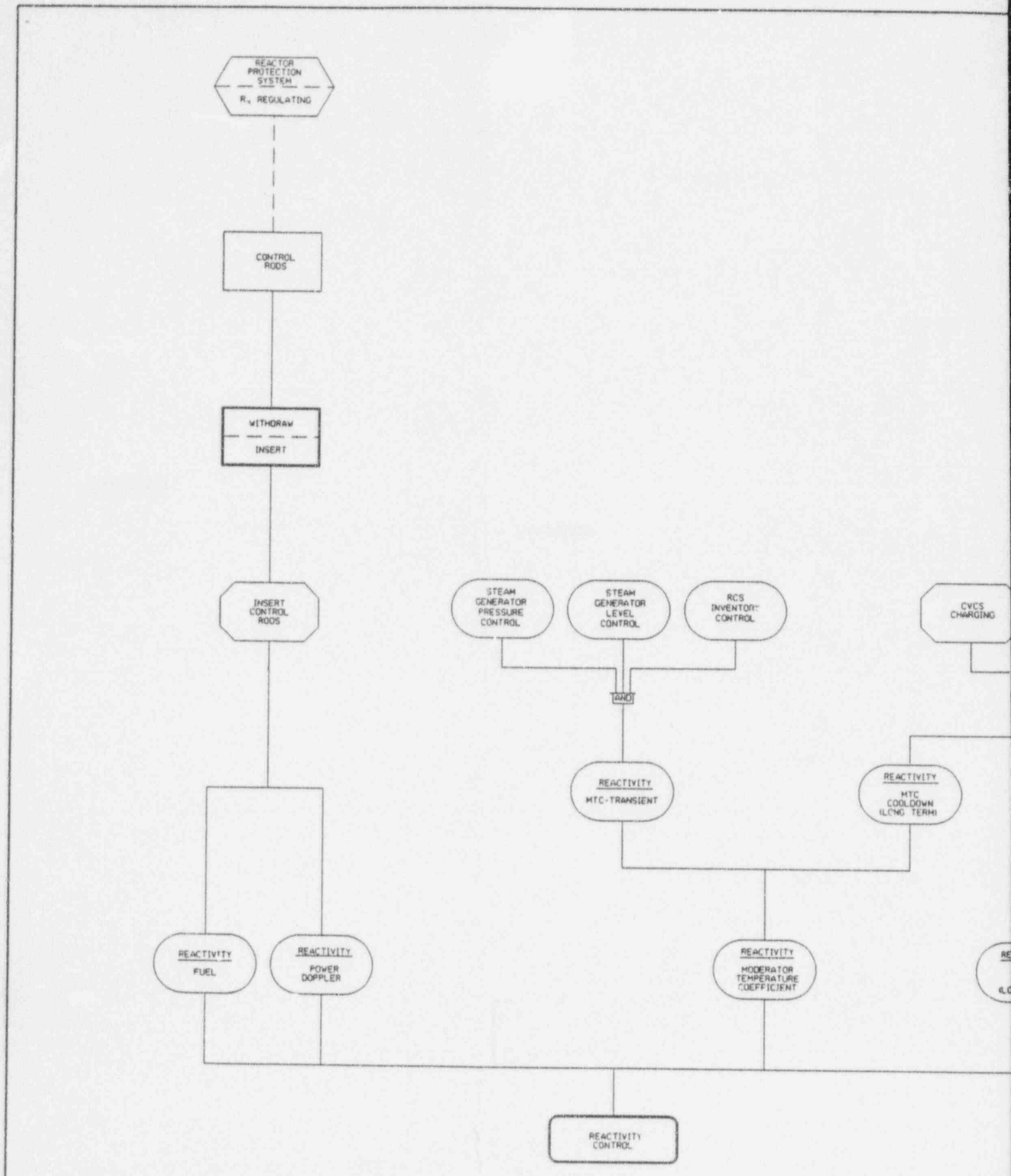
5. CONTAINMENT INTEGRITY & RADIATION CONTROL
Maintain the integrity of the reactor building as a fission product boundary. For LOCA and steam generator tube rupture events, limit fission product release to maintain exposure within 10CFR100 limits.

Maintain Reactor Building environmental conditions (temperature, pressure, and combustible gas concentrations) within the RB design basis.
Isolate non-accident mitigation process lines penetrating the containment structure. Maintain isolation capability for process lines required for accident mitigation.
Provide penetration cooling.
Maintain the integrity of electrical penetrations.
Maintain the integrity of access hatches and their sealing function.

6. ELECTRICAL POWER
Provide electric power to equipment required to achieve and maintain safe shutdown

7. ESSENTIAL SUPPORT SYSTEMS
Maintain the operability of cooling water systems essential to the proper operation of safe shutdown systems. (Component-specific systems are included with the safety function provided by that system.)

8. ENVIRONMENTAL CONTROL
Maintain acceptable environmental conditions (temperature and radiation level) in plant areas requiring personnel access to achieve a safe shutdown condition Provide ventilation and cooling to vital equipment.


REACTOR PROTECTION SYSTEM
R, REGULATING
CONTROL RODS
WITHDRAW
INSERT
INSERT CONTROL RODS
STEAM GENERATOR PRESSURE CONTROL
STEAM GENERATOR LEVEL CONTROL
RCS INVENTORY CONTROL
CVCS CHARGING
AND
REACTIVITY MTC-TRANSIENT
REACTIVITY MTC COOLDOWN (LONG TERM)
REACTIVITY FUEL
REACTIVITY POWER DOPPLER
REACTIVITY MODERATOR TEMPERATURE COEFFICIENT
REACTIVITY CONTROL

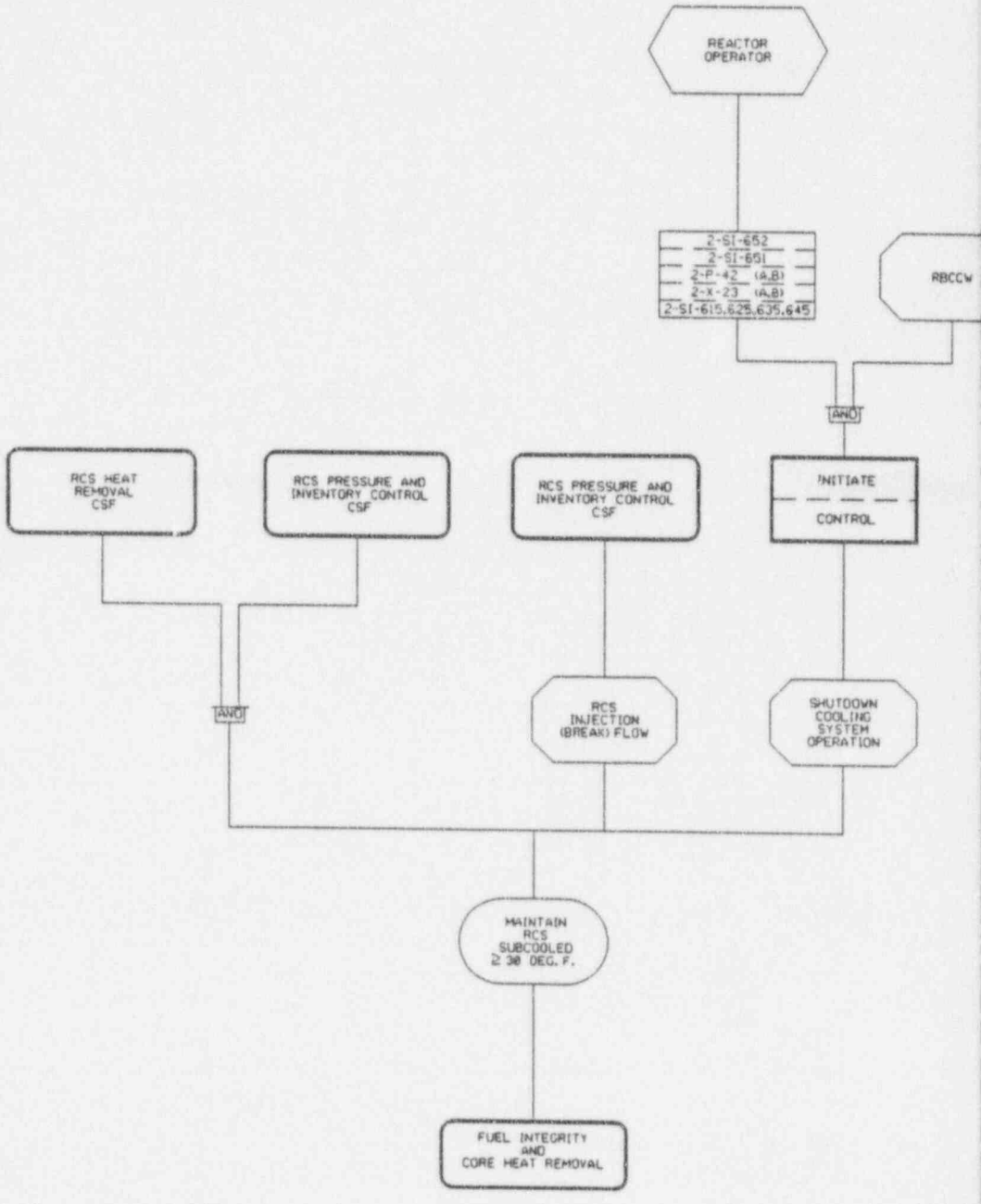
PARSONS PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2CSFD-REACT	0 REV.

REACTIVITY CONTROL

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
7/8/97	7/18/97	7/18/97
N/A	N/A	N/A
INTERFACE DATE	INTERFACE DATE	INTERFACE DATE

PPGI-FILE: 526005:reactcon.dgn
PPGI-DATE: 18-Jul-97 12:36

9707220037-01


REACTOR OPERATOR
2-SI-652
2-SI-651
2-P-42 (A,B)
2-X-23 (A,B)
2-SI-615,625,635,645
RBCCW
AND
RCS HEAT REMOVAL CSF
RCS PRESSURE AND INVENTORY CONTROL CSF
RCS PRESSURE AND INVENTORY CONTROL CSF
INITIATE
CONTROL
AND
RCS INJECTION (BREAK) FLOW
SHUTDOWN COOLING SYSTEM OPERATION
MAINTAIN RCS SUBCOOLED ≥ 30 DEG. F.
FUEL INTEGRITY AND CORE HEAT REMOVAL

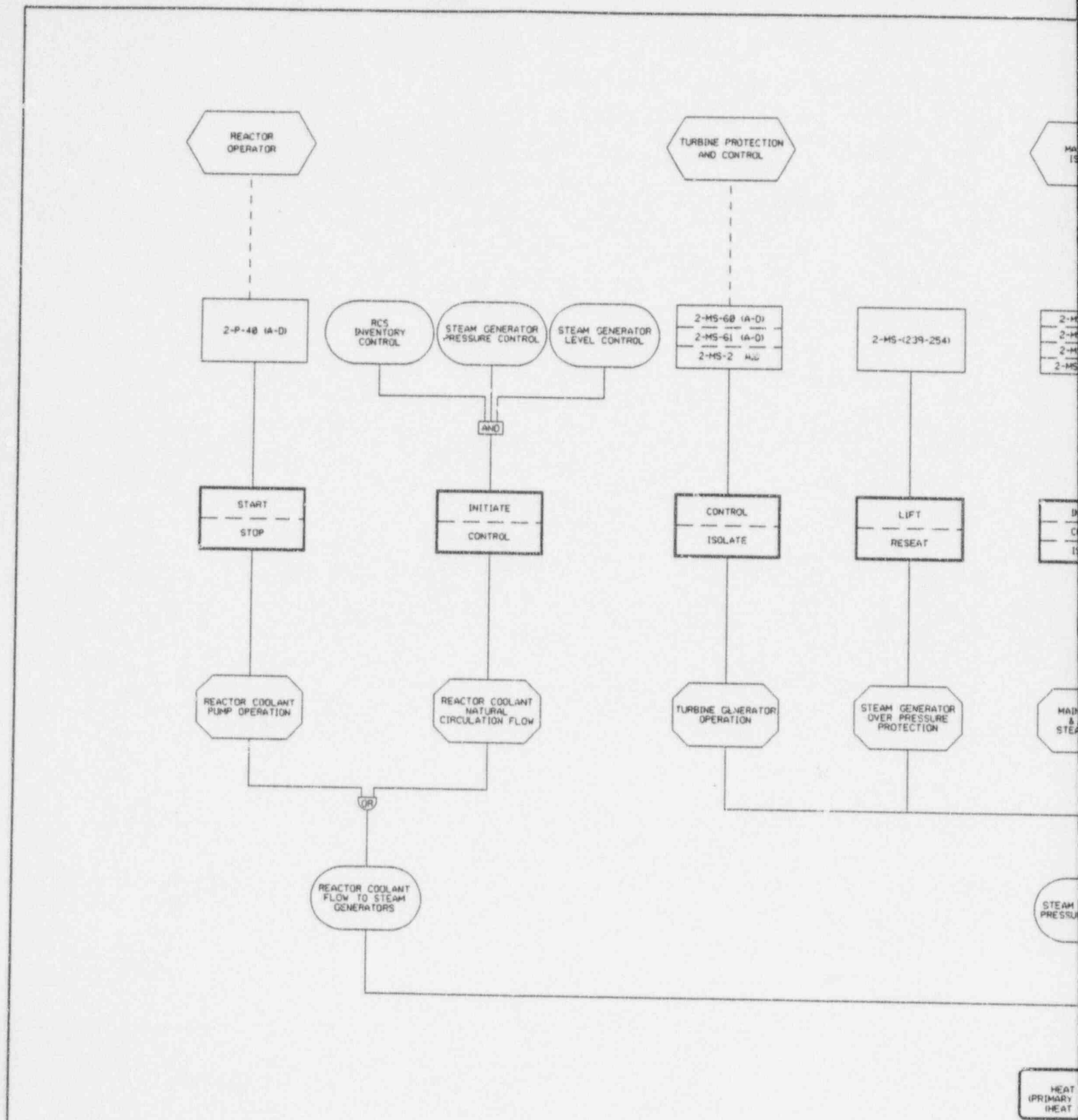
PARSONS PARSONS POWER GROUP INC. READING / BOSTON / CHARLOTTE / CHATTANOOGA	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2CSFD-FICHR	Ø REV.

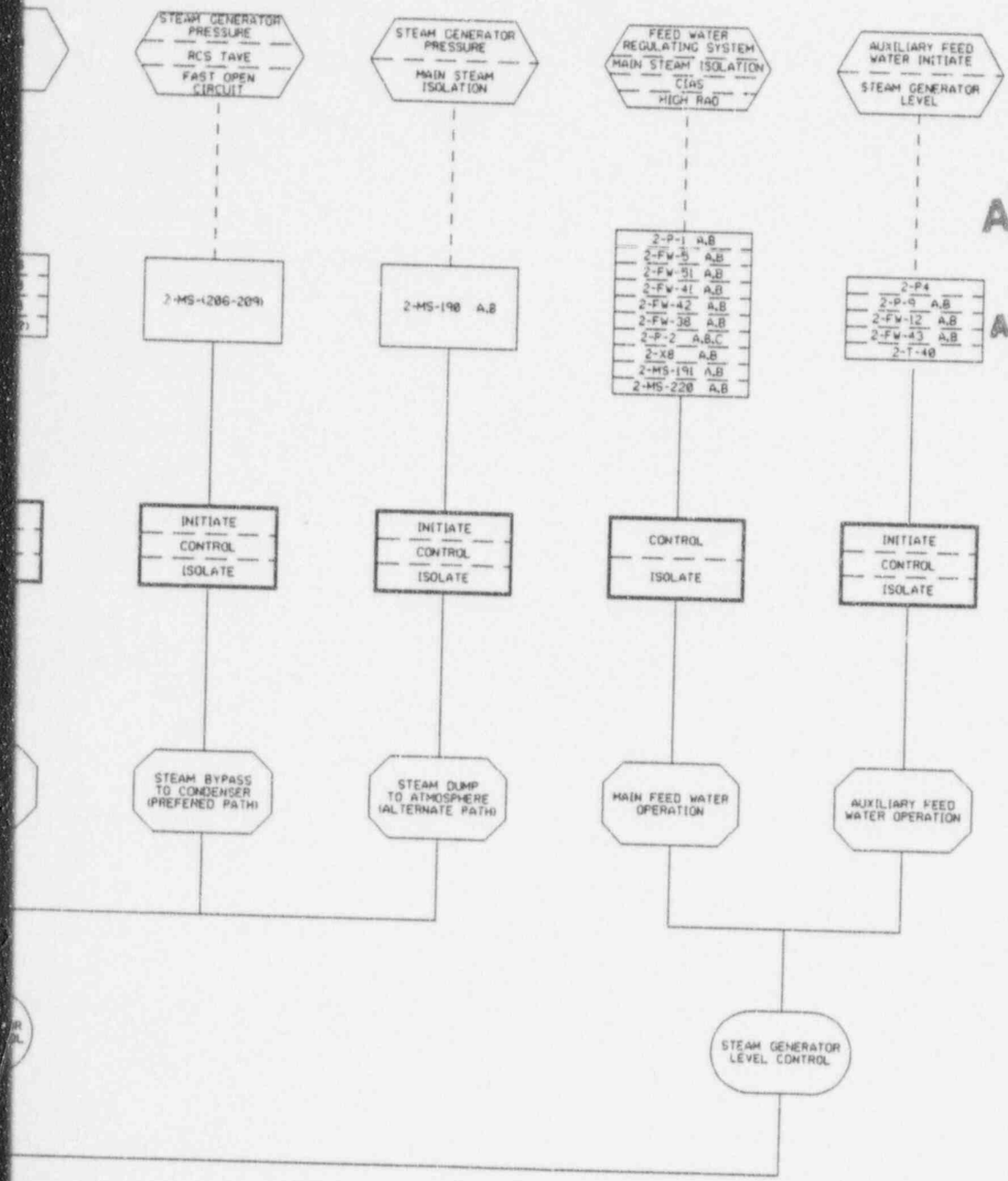
FUEL INTEGRITY
AND
CORE HEAT REMOVAL

R.T. Glaviano 7/18/97	J.H. Smith 7/18/97	[illegible] 7/18/97
ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
N/A	N/A	N/A
INTERFACE DATE	INTERFACE DATE	INTERFACE DATE

PPGI-FILE: 526005:fuelintg.dgn
PPGI-DATE: 18-Jul-97 12:19

9707220037-02


REACTOR OPERATOR
TURBINE PROTECTION AND CONTROL
2-P-40 (A-D)
RCS INVENTORY CONTROL
STEAM GENERATOR PRESSURE CONTROL
STEAM GENERATOR LEVEL CONTROL
2-MS-60 (A-D)
2-MS-61 (A-D)
2-MS-2 A,D
2-MS-(239-254)
AND
START
STOP
INITIATE
CONTROL
CONTROL
ISOLATE
LIFT
RESEAT
REACTOR COOLANT PUMP OPERATION
REACTOR COOLANT NATURAL CIRCULATION FLOW
TURBINE GENERATOR OPERATION
STEAM GENERATOR OVER PRESSURE PROTECTION
OR
REACTOR COOLANT FLOW TO STEAM GENERATORS



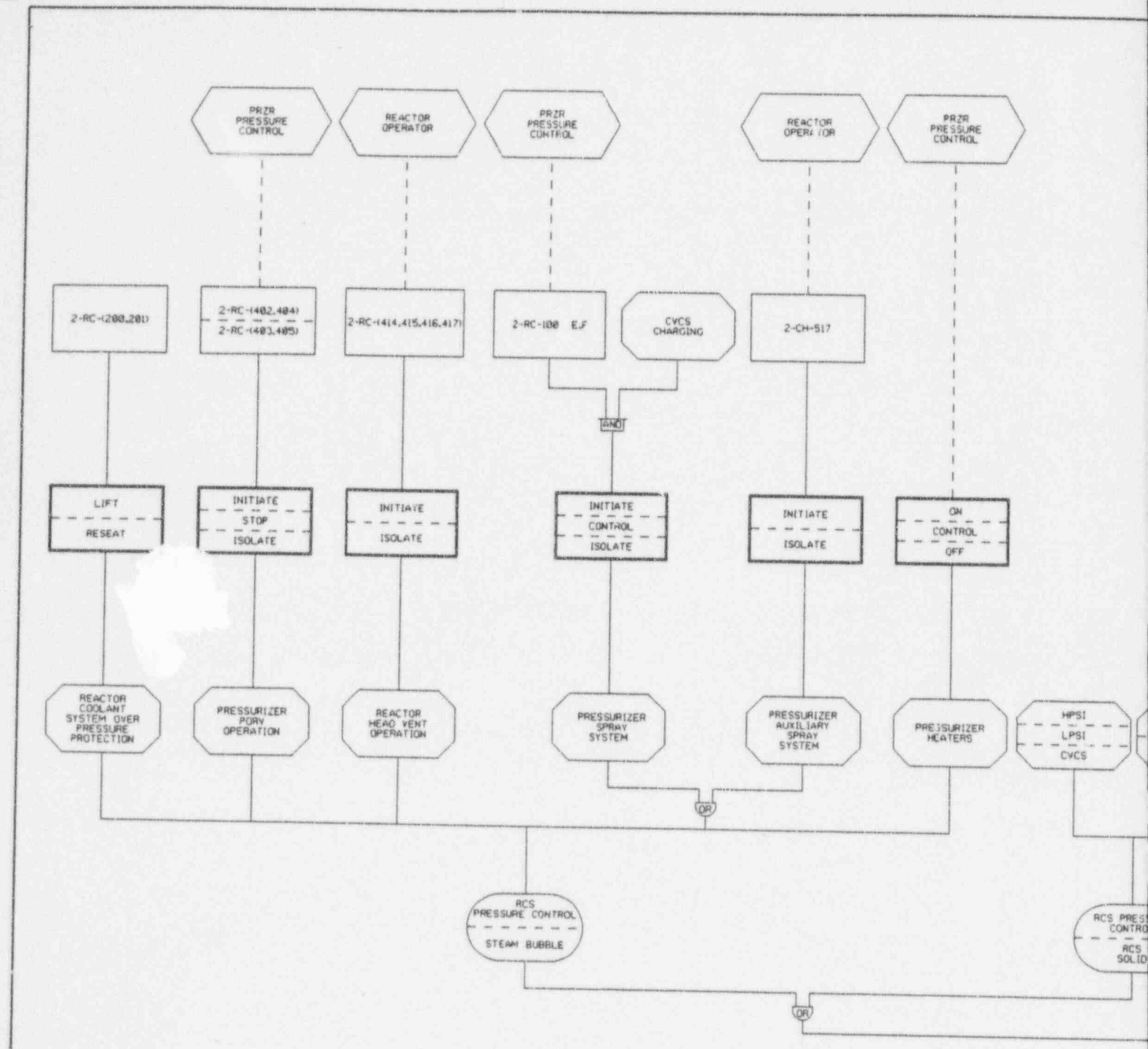
PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2CSFD-RCSHR	0 REV.

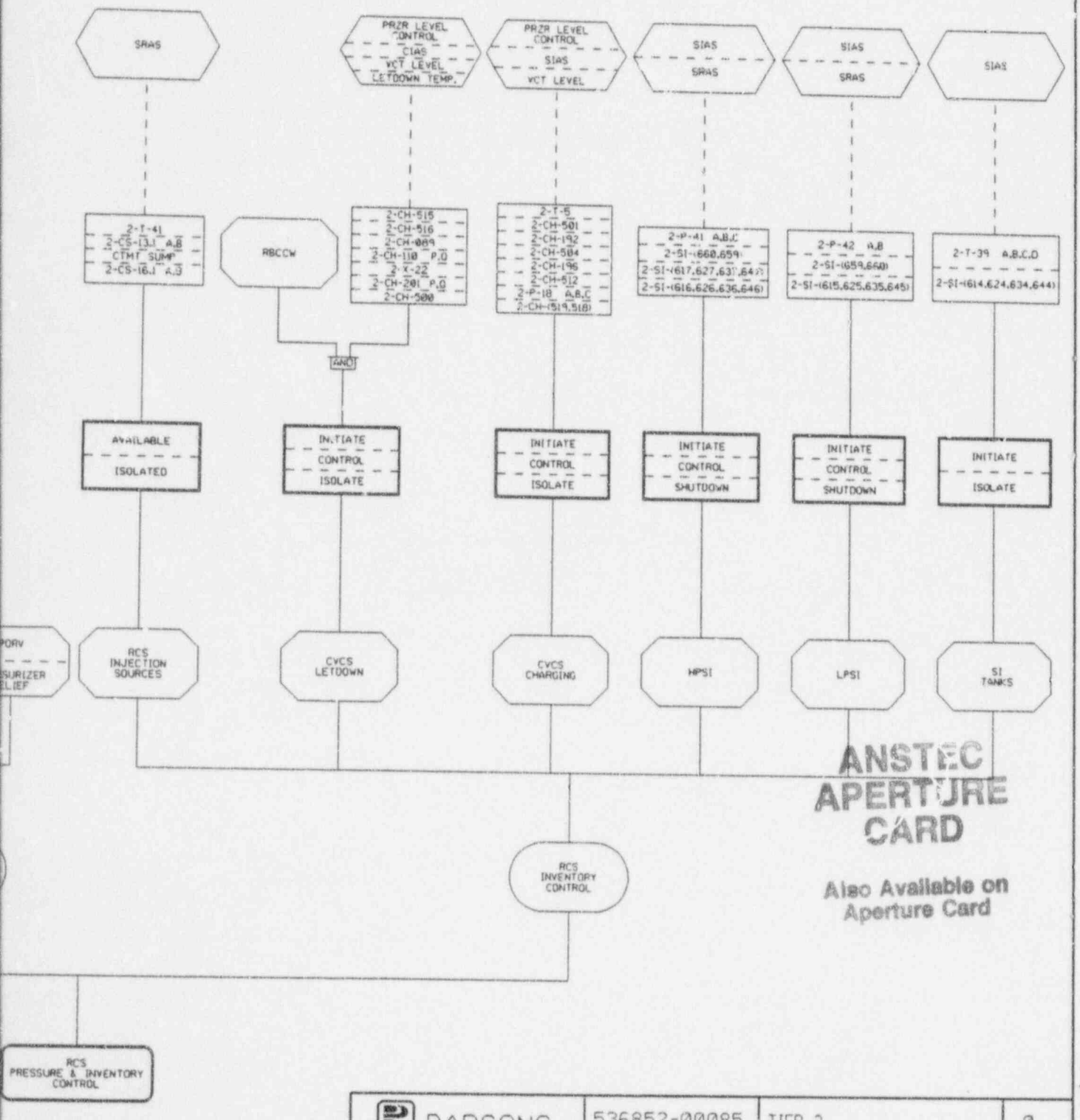
RCS HEAT REMOVAL

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
R.T. Gravino 7/18/97	J.H. Brendel 7/18/97	7/18/97
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE

PPGI-FILE: 526005:reshtrem.dgn
PPGI-DATE: 18-Jul-97 12:27

9707220037-03


PRZR PRESSURE CONTROL
REACTOR OPERATOR
PRZR PRESSURE CONTROL
REACTOR OPERATOR
PRZR PRESSURE CONTROL
2-RC-(200,201)
2-RC-(402,404)
2-RC-(403,405)
2-RC-(414,415,416,417)
2-RC-100 E,F
CVCS CHARGING
2-CH-517
AND
LIFT
RESEAT
INITIATE
STOP
ISOLATE
INITIATE
ISOLATE
INITIATE
CONTROL
ISOLATE
INITIATE
ISOLATE
ON
CONTROL
OFF
REACTOR COOLANT SYSTEM OVER PRESSURE PROTECTION
PRESSURIZER PORV OPERATION
REACTOR HEAD VENT OPERATION
PRESSURIZER SPRAY SYSTEM
PRESSURIZER AUXILIARY SPRAY SYSTEM
PRESSURIZER HEATERS
HPSI
LPSI
CVCS
OR
RCS PRESSURE CONTROL
STEAM BUBBLE
OR



PARSONS POWER GROUP INC.	536852-00085	TIER 2	0
	WORK ORDER NO.	FIGURE #M2-T2CSFD-RCSPI	REV.

RCS
PRESSURE & INVENTORY
CONTROL

ORIGINATED	DATE	REVIEWED	DATE	APPROVED	DATE
R.T. Chiavaro	7/18/97	J.H. Brenda	7/18/97	[signature]	7/21/97
N/A	INTERFACE DATE	N/A	INTERFACE DATE	N/A.	INTERFACE DATE

PPGI-FILE: 526005:rcsprinc.dgn
PPGI-DATE: 18-Jul-97 12:28

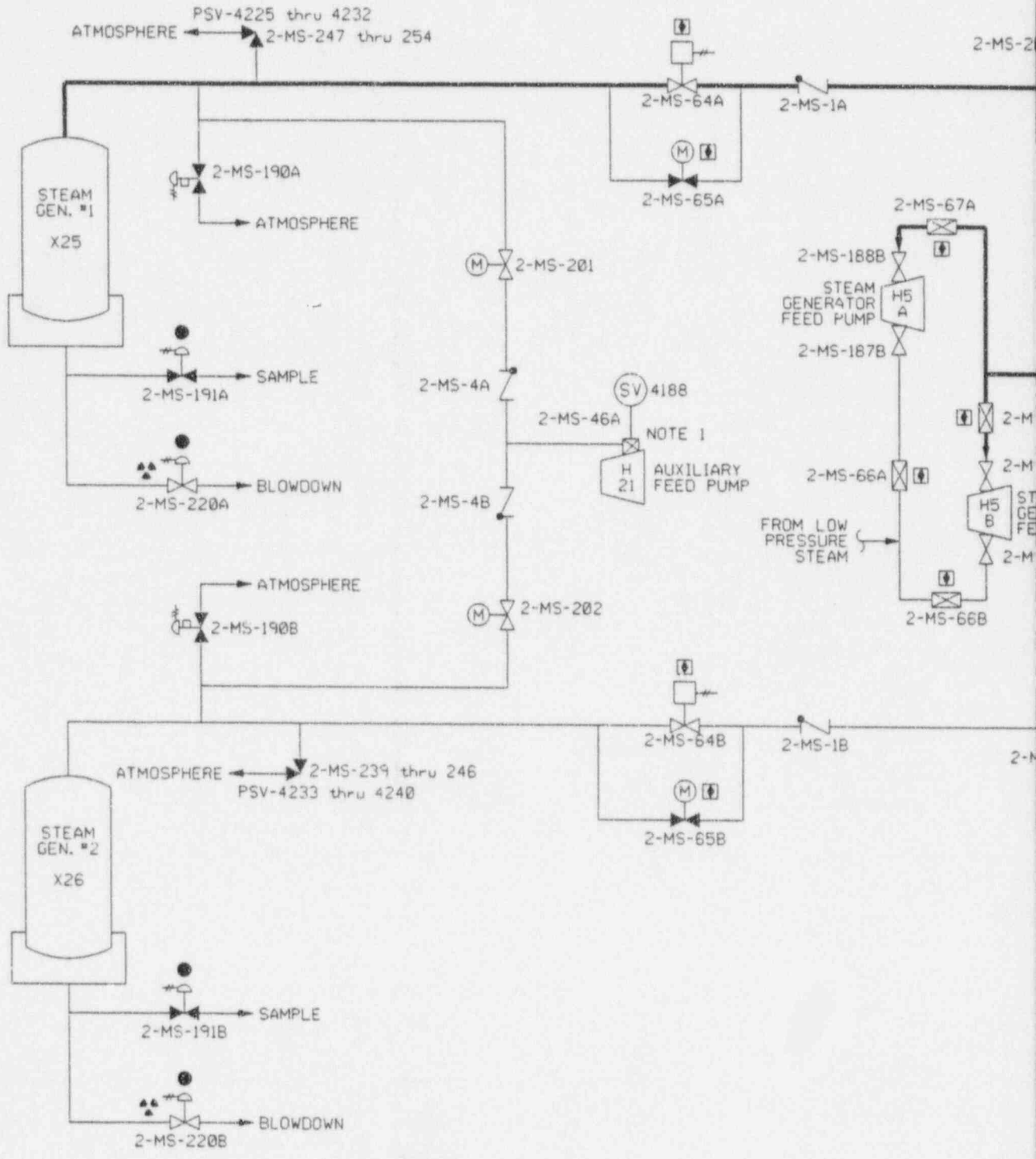
9707220037-04

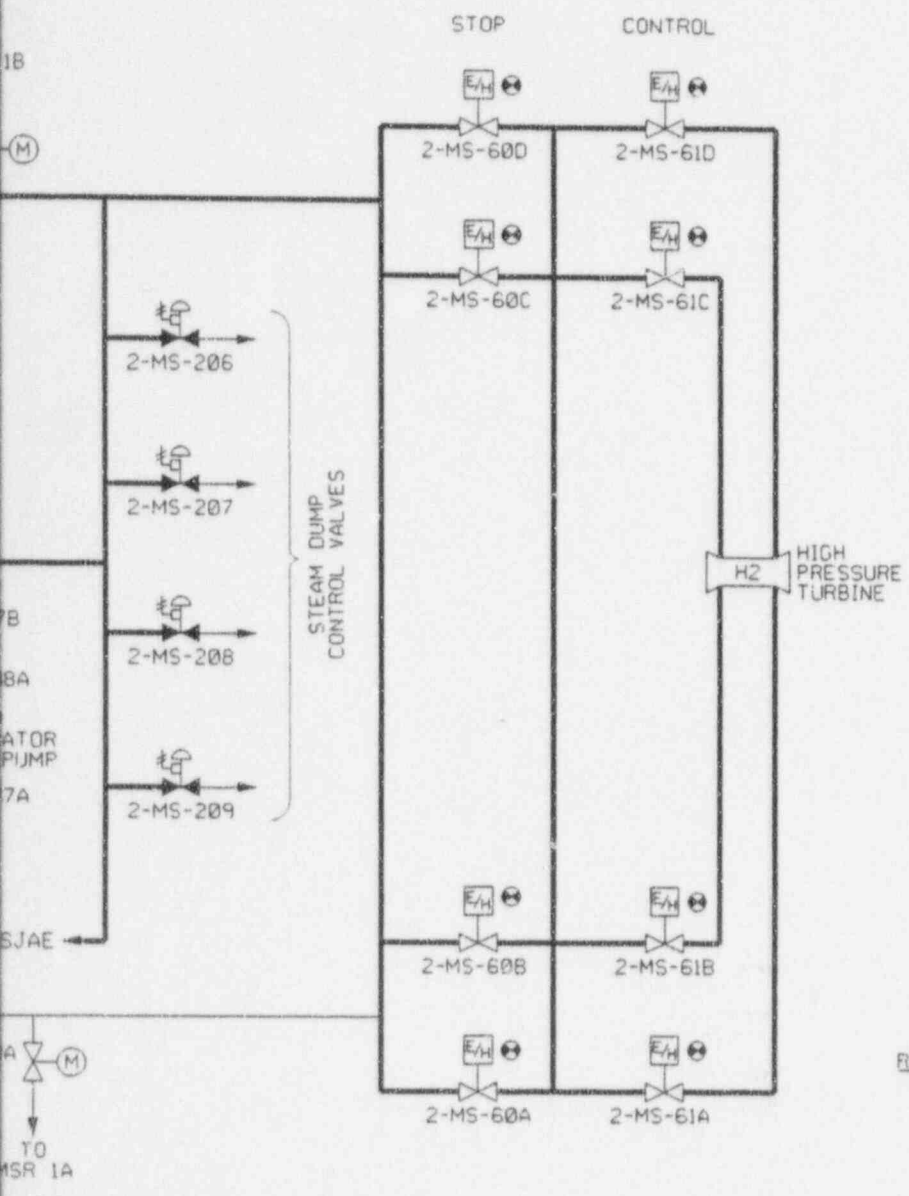
PARSONS POWER

System Boundary Diagrams

Overcooling Events

Millstone Unit 2


PSV-4225 thru 4232
ATMOSPHERE
2-MS-247 thru 254
2-MS-64A
2-MS-1A
2-MS-65A
STEAM GEN. #1
X25
2-MS-190A
ATMOSPHERE
2-MS-201
2-MS-67A
2-MS-188B
STEAM GENERATOR FEED PUMP
H5 A
2-MS-187B
SAMPLE
2-MS-191A
2-MS-4A
SV 4188
2-MS-46A
NOTE 1
H 21
AUXILIARY FEED PUMP
2-MS-66A
BLOWDOWN
2-MS-220A
2-MS-4B
FROM LOW PRESSURE STEAM
H5 B
ATMOSPHERE
2-MS-190B
2-MS-202
2-MS-66B
2-MS-64B
2-MS-1B
ATMOSPHERE
2-MS-239 thru 246
PSV-4233 thru 4240
2-MS-65B
STEAM GEN. #2
X26
SAMPLE
2-MS-191B
BLOWDOWN
2-MS-220B



LEGEND:

- ✳ - RPS SIGNAL
- ◧ - MSI CLOSE/STOP
- ● - CIAS CLOSE/STOP
- ☢ - HIGH RAD CLOSE/STOP
- ☢ - TURBINE TRIP
- ——— - TRAIN 'A' OR COMMON FLOW PATH

NOTES:

1. VALVE OPENS ON MANUAL DEMAND SIGNAL.

REFERENCES:

DWG. 25203-26002, SH.1, REV. 36
DWG. 25203-26002, SH.2, REV. 21
DWG. 25203-26002, SH.3, REV. 23
DWG. 25203-26002, SH.4, REV. 16
DWG. 25203-26002, SH.5, REV. 6

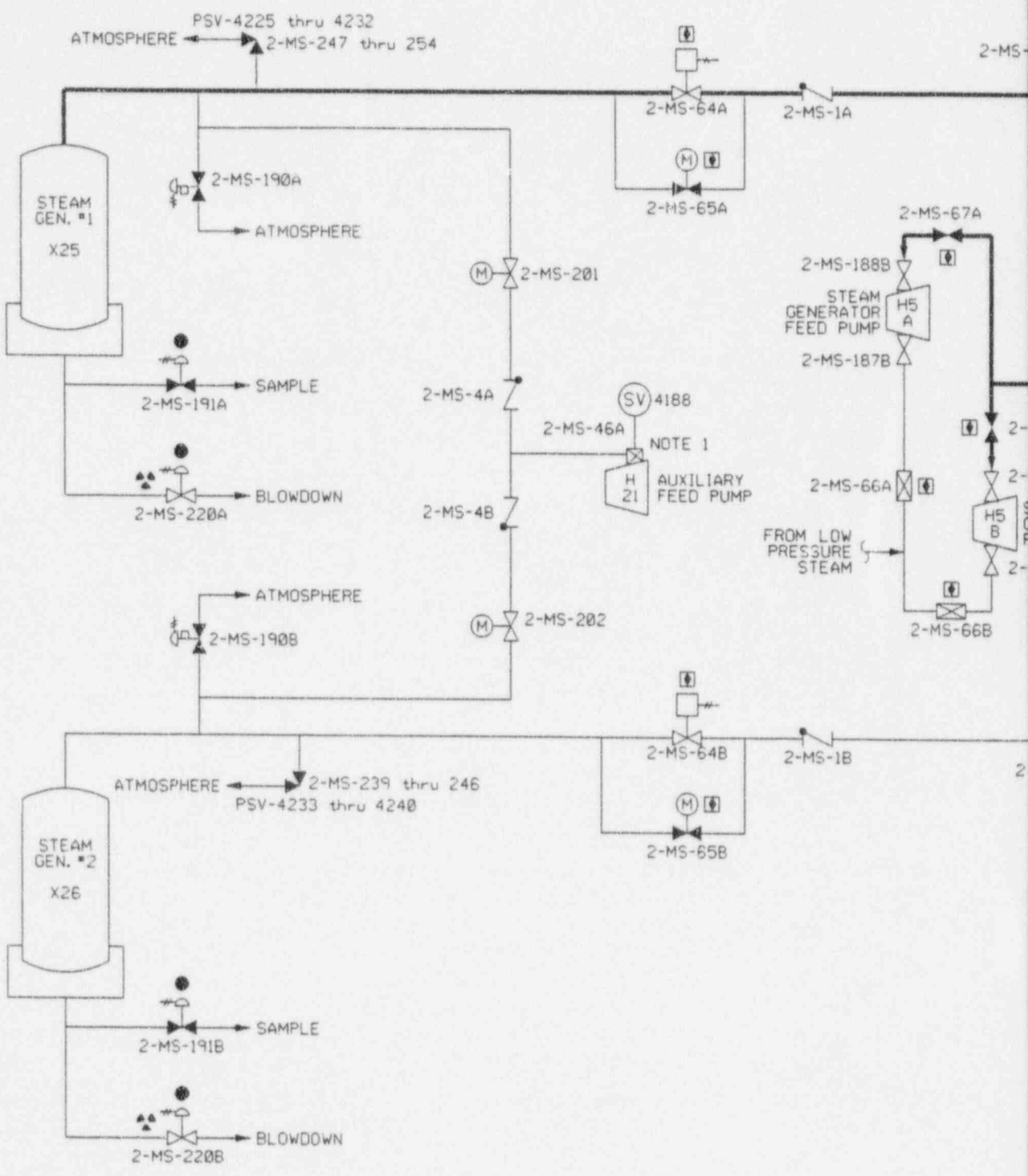
PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2SBD-MS1	0 REV.

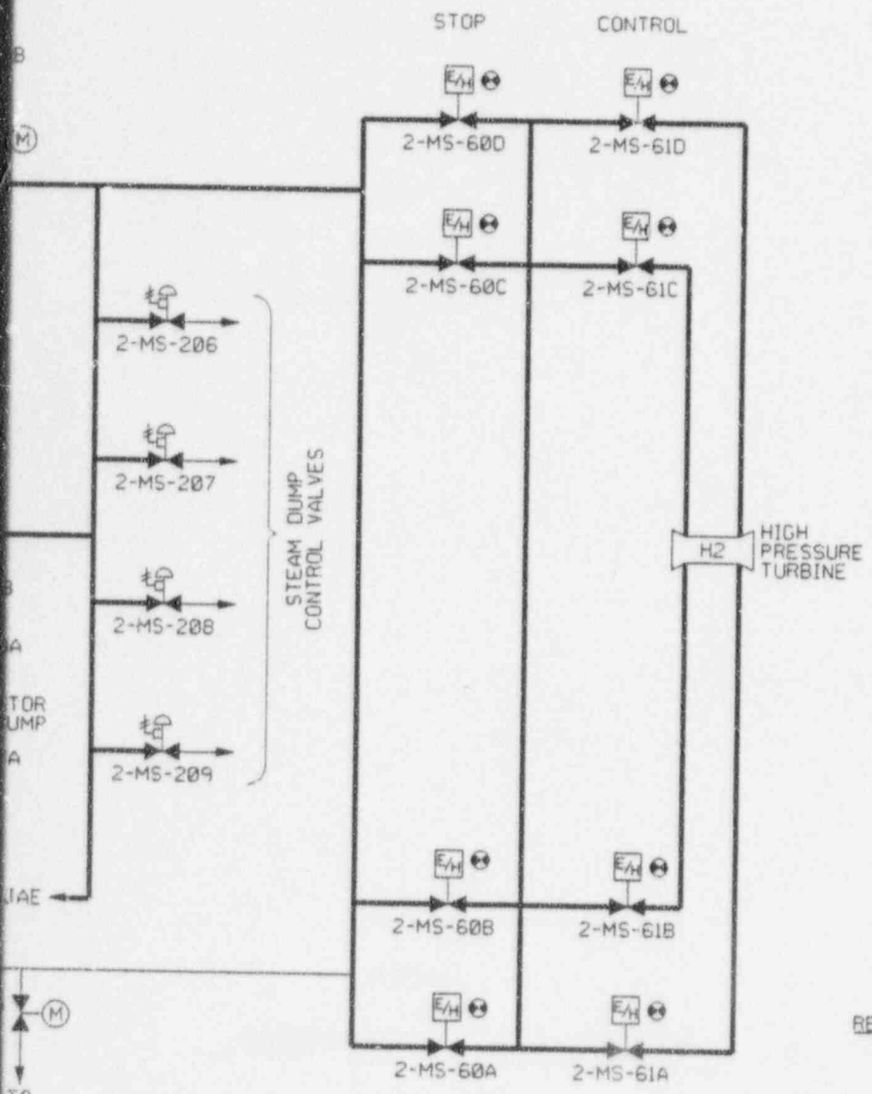
MAIN STEAM

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
7/18/97	RS Faust 7/18/97	7/18/97
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE

PPGI-FILE: 526005:mainstem.dgn
PPGI-DATE: 18-Jul-97 12:24

9707220037-05


PSV-4225 thru 4232
ATMOSPHERE
2-MS-247 thru 254
2-MS-64A
2-MS-1A
2-MS-65A
STEAM GEN. #1 X25
2-MS-190A
ATMOSPHERE
2-MS-201
2-MS-67A
2-MS-188B
STEAM GENERATOR FEED PUMP
H5 A
2-MS-187B
SAMPLE
2-MS-191A
2-MS-4A
SV 4188
2-MS-46A
NOTE 1
BLOWDOWN
2-MS-220A
H 21
AUXILIARY FEED PUMP
2-MS-4B
2-MS-66A
H5 B
FROM LOW PRESSURE STEAM
ATMOSPHERE
2-MS-190B
2-MS-202
2-MS-66B
2-MS-64B
2-MS-1B
ATMOSPHERE
2-MS-239 thru 246
PSV-4233 thru 4240
2-MS-65B
STEAM GEN. #2 X26
SAMPLE
2-MS-191B
BLOWDOWN
2-MS-220B



LEGEND:

- ✳ - RPS SIGNAL
- ⊡ - MSI CLOSE/STOP
- ● - CIAS CLOSE/STOP
- ☢ - HIGH RAD CLOSE/STOP
- ⊖ - TURBINE TRIP
- ——— - TRAIN 'A' OR COMMON FLOW PATH

NOTES:

1. VALVE OPENS ON MANUAL DEMAND SIGNAL.

REFERENCES:

DWG. 25203-26002, SH.1, REV. 36
DWG. 25203-26002, SH.2, REV. 21
DWG. 25203-26002, SH.3, REV. 23
DWG. 25203-26002, SH.4, REV. 16
DWG. 25203-26002, SH.5, REV. 6

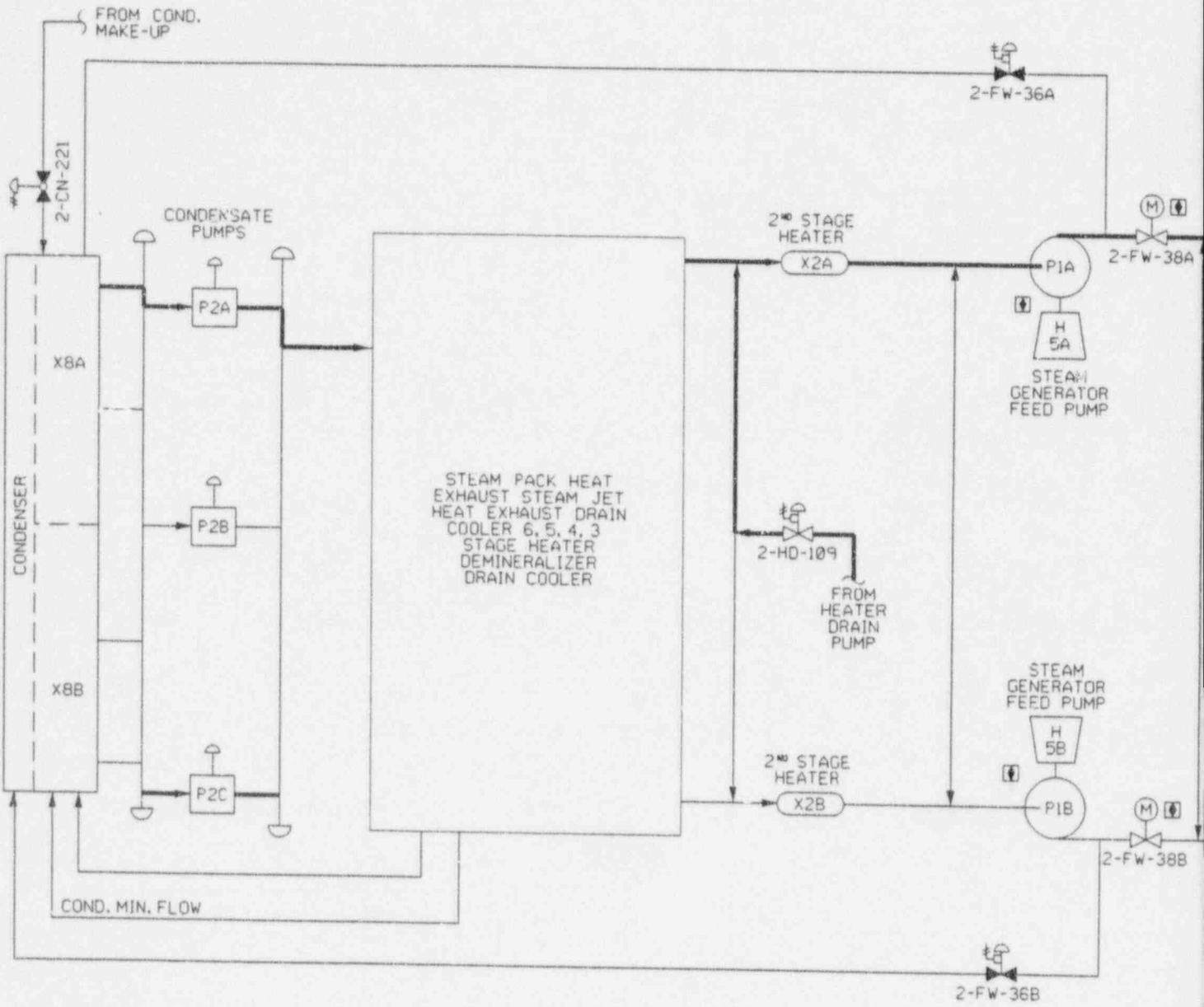
PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2SBD-MS2	0 REV.

MAIN STEAM
HOT ZERO POWER ALIGNMENT

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
7/18/97	7/18/97	7/18/97
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A. INTERFACE DATE

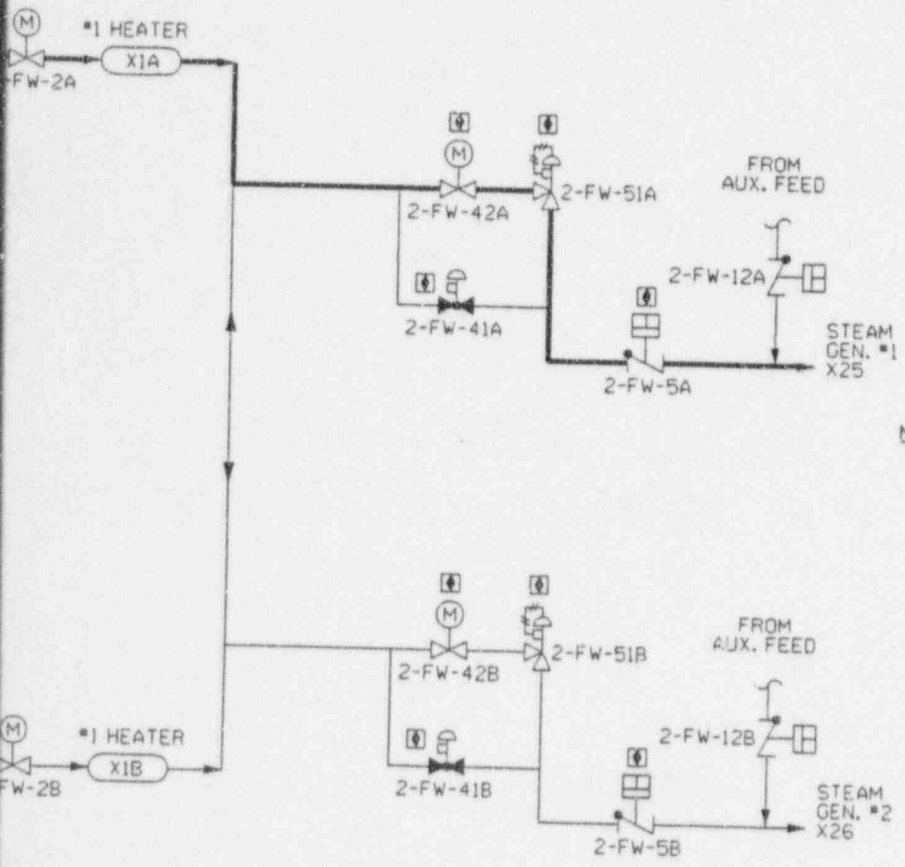
PPGI-FILE: 526005:mainstem.dgn
PPGI-DATE: 18-Jul-97 12:24

9707220037-06


FROM COND.
MAKE-UP
2-FW-36A
2-CN-221
CONDENSATE
PUMPS
2ND STAGE
HEATER
X2A
P1A
2-FW-38A
H
5A
STEAM
GENERATOR
FEED PUMP
X8A
P2A
CONDENSER
STEAM PACK HEAT
EXHAUST STEAM JET
HEAT EXHAUST DRAIN
COOLER 6, 5, 4, 3
STAGE HEATER
DEMINERALIZER
DRAIN COOLER
2-HD-109
FROM
HEATER
DRAIN
PUMP
P2B
X8B
STEAM
GENERATOR
FEED PUMP
H
5B
2ND STAGE
HEATER
X2B
P2C
P1B
2-FW-38B
COND. MIN. FLOW
2-FW-36B

LEGEND:

- MSI CLOSE/STOP
- TRAIN 'A' OR COMMON FLOW PATH



NOTES:

REFERENCES:

25203-26005 SH1 REV 21
25203-26005 SH2 REV 30

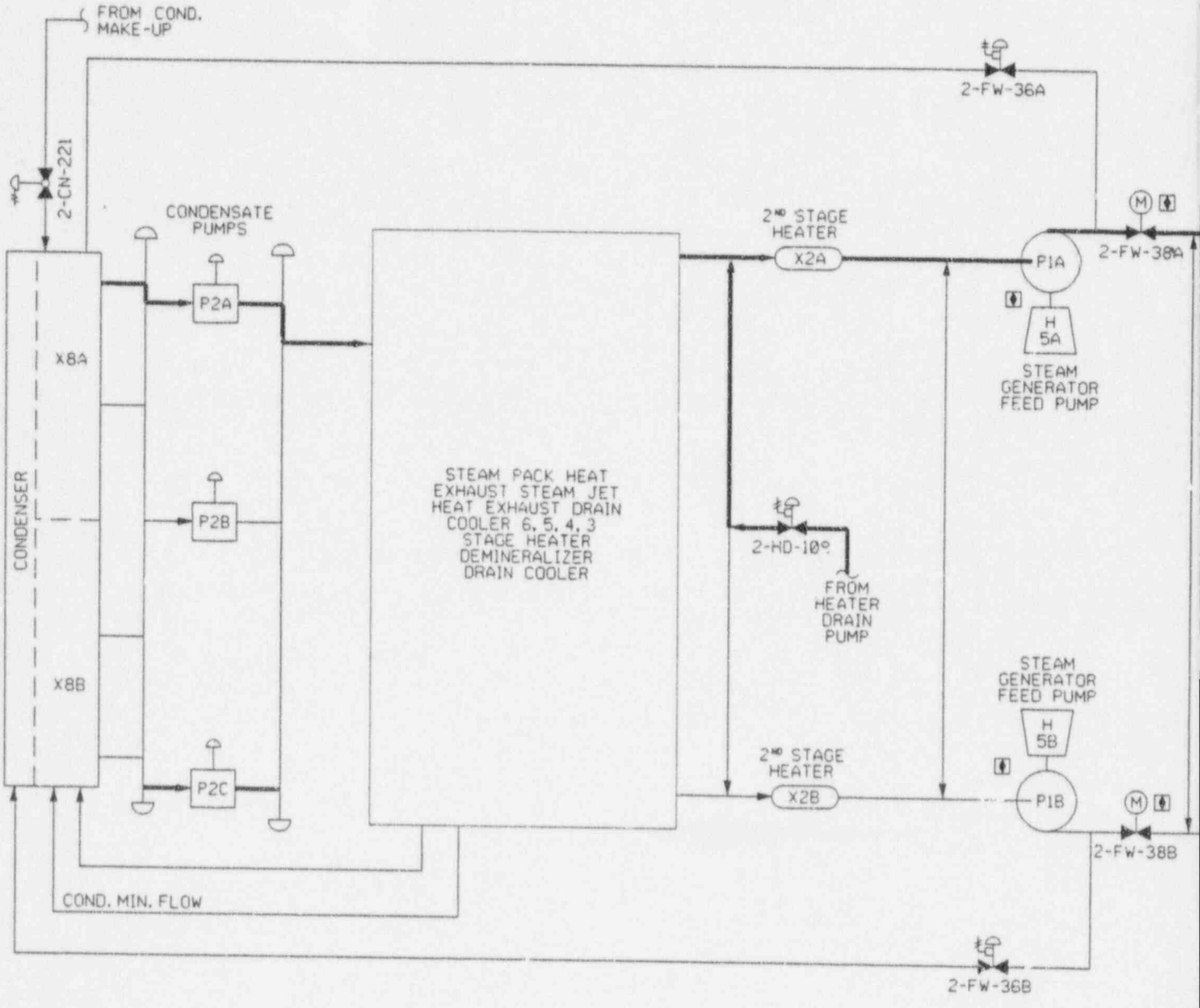
PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE *M2-T2SBD-MFW1	0 REV.

MAIN FEED

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
7/18/97	R.S. Faust 7/18/97	A.T. Galiano 7/18/97
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE

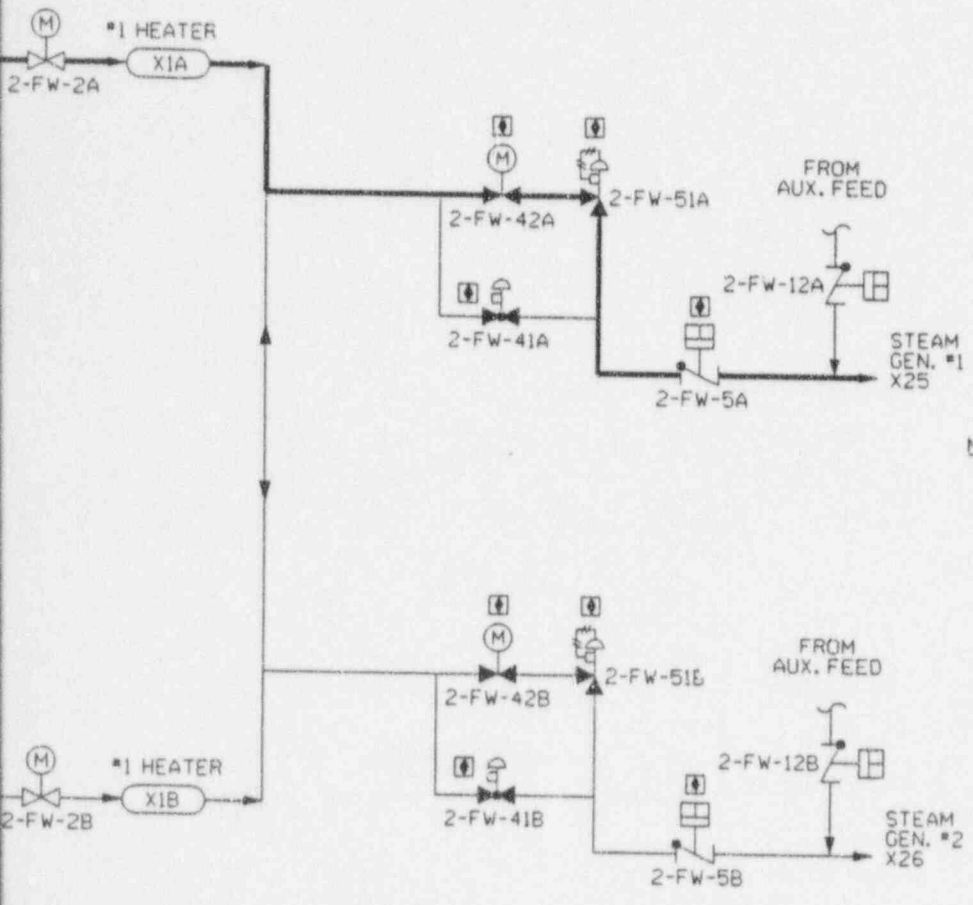
PPGI-FILE: 526005:mainfeed.dgn
PPGI-DATE: 18-Jul-97 12:23

9707220037-07


FROM COND.
MAKE-UP
2-FW-36A
2-CN-221
CONDENSATE
PUMPS
2ND STAGE
HEATER
X2A
P1A
2-FW-38A
H
5A
STEAM
GENERATOR
FEED PUMP
X8A
P2A
CONDENSER
STEAM PACK HEAT
EXHAUST STEAM JET
HEAT EXHAUST DRAIN
COOLER 6, 5, 4, 3
STAGE HEATER
DEMINERALIZER
DRAIN COOLER
P2B
2-HD-10
FROM
HEATER
DRAIN
PUMP
STEAM
GENERATOR
FEED PUMP
H
5B
X8B
2ND STAGE
HEATER
X2B
P1B
2-FW-38B
P2C
COND. MIN. FLOW
2-FW-36B

LEGEND:

- MSI CLOSE/STOP
- TRAIN 'A' OR COMMON FLOW PATH



NOTES:

REFERENCES:

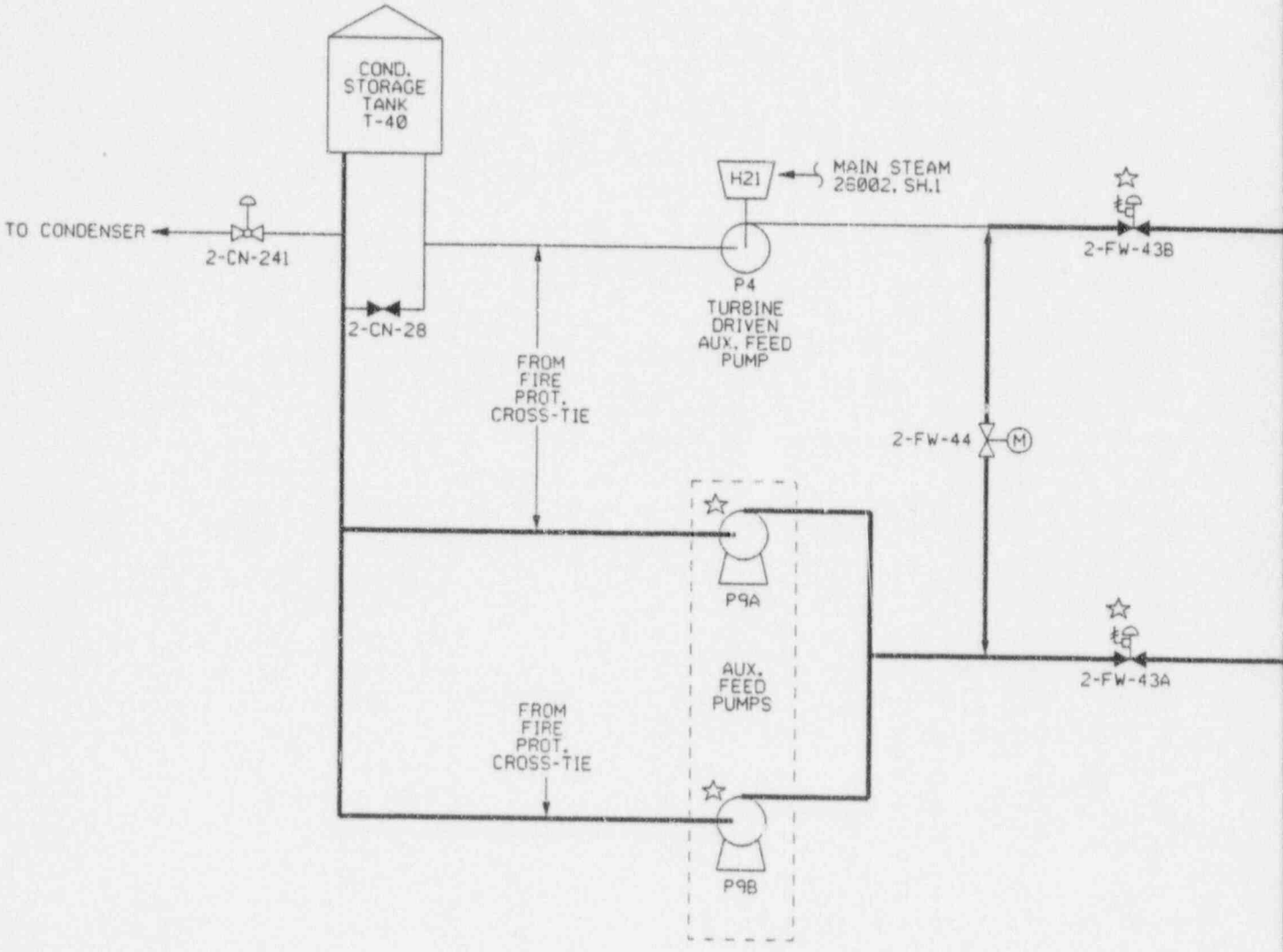
25203-26005 SH1 REV 21
25203-26005 SH2 REV 30

PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE *M2-T2SBD-MFW2	0 REV.

MAIN FEED
HOT ZERO POWER ALIGNMENT

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
7/10/97	7/18/97	7/18/97
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE

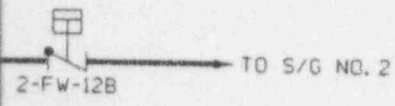
PPGI-FILE: 526005:mainfeed.dgn
PPGI-DATE: 18-Jul-97 12:23


COND.
STORAGE
TANK
T-40
TO CONDENSER
2-CN-241
2-CN-28
H21
MAIN STEAM
26002, SH.1
P4
TURBINE
DRIVEN
AUX. FEED
PUMP
2-FW-43B
FROM
FIRE
PROT.
CROSS-TIE
2-FW-44
M
P9A
AUX.
FEED
PUMPS
2-FW-43A
FROM
FIRE
PROT.
CROSS-TIE
P9B

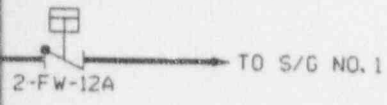
LEGEND:

☆ - AUXILIARY FEED INITIATE SIGNAL OPEN

——— - TRAIN "A" OR COMMON FLOW PATH



NOTES:

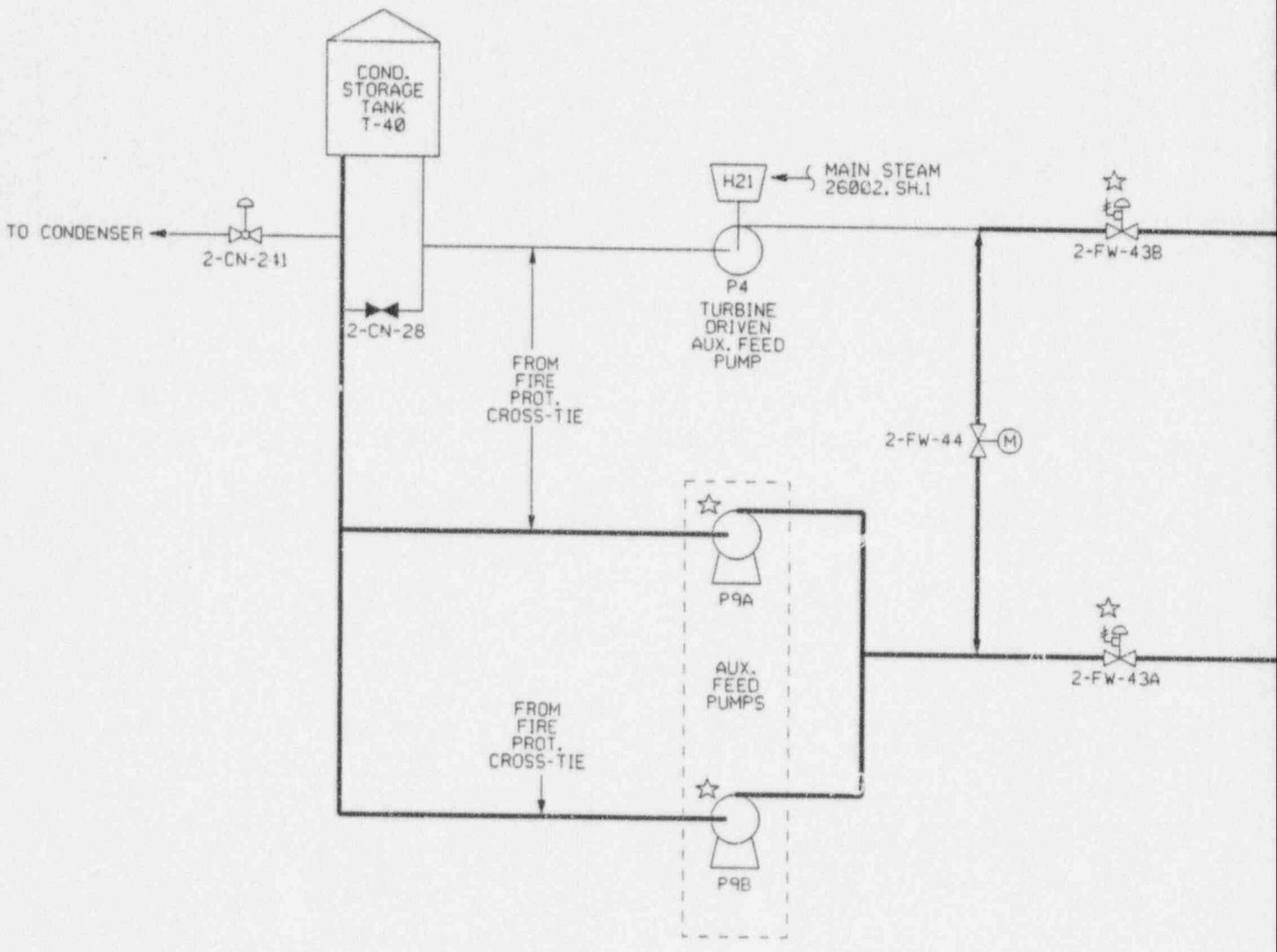


REFERENCES:

25203-26002, SH.1, REV. 36
25203-26005, SH.2, REV. 30
25203-26005, SH.3, REV. 28

PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2SBD-AFWI	0 REV.
AUXILIARY FEEDWATER			
7/18/97 ORIGINATED DATE	7/18/97 REVIEWED DATE	7/18/97 APPROVED DATE	
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE	

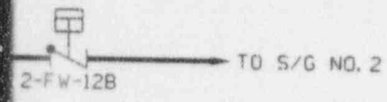
PPGI-FILE: 526005:auxwater.dgn
PPGI-DATE: 18-Jul-97 12:15


COND.
STORAGE
TANK
T-40
TO CONDENSER
2-CN-241
2-CN-28
H21
MAIN STEAM
26002, SH.1
P4
TURBINE
DRIVEN
AUX. FEED
PUMP
2-FW-43B
FROM
FIRE
PROT.
CROSS-TIE
2-FW-44
M
P9A
AUX.
FEED
PUMPS
2-FW-43A
FROM
FIRE
PROT.
CROSS-TIE
P9B

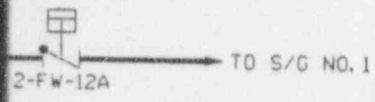
LEGEND:

☆ - AUXILIARY FEED INITIATE SIGNAL OPEN

——— - TRAIN 'A' OR COMMON FLOW PATH



NOTES:



REFERENCES:

25203-26002, SH.1, REV. 36
25203-26005, SH.2, REV. 30
25203-26005, SH.3, REV. 28

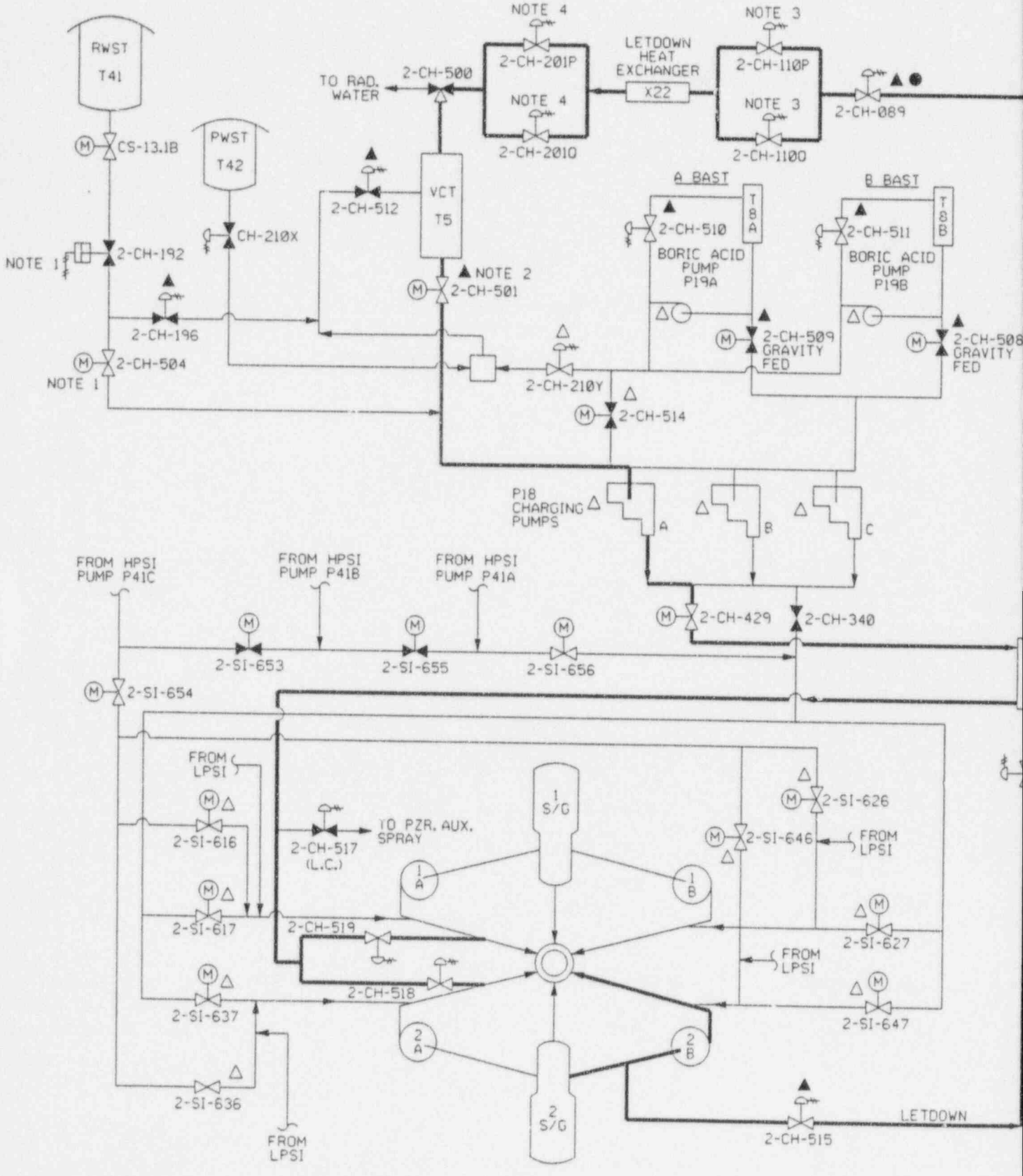
PARSONS POWER GROUP INC.	536852-00085	TIER 2	Ø
	WORK ORDER NO.	FIGURE #M2-T2SBD-AFW2	REV.

AUXILIARY FEEDWATER
HOT ZERO POWER ALIGNMENT

ORIGINATED	REVIEWED	APPROVED
7/18/97 DATE	7/18/97 DATE	7/18/97 DATE
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE

PPGI-FILE: 5260N5:auxwater.dgn
PPGI-DATE: 18-Jul-97 12:16

9707220057-10


RWST
T41
PWST
T42
CS-13.1B
2-CH-192
NOTE 1
CH-210X
2-CH-196
2-CH-504
NOTE 1
2-CH-512
VCT
T5
NOTE 2
2-CH-501
TO RAD. WATER
2-CH-500
NOTE 4
2-CH-201P
NOTE 4
2-CH-2010
LETDOWN HEAT EXCHANGER
X22
NOTE 3
2-CH-110P
NOTE 3
2-CH-1100
2-CH-089
A BASI
2-CH-510
T8A
BORIC ACID PUMP P19A
B BASI
2-CH-511
T8B
BORIC ACID PUMP P19B
2-CH-509 GRAVITY FED
2-CH-508 GRAVITY FED
2-CH-210Y
2-CH-514
P18 CHARGING PUMPS
A
B
C
FROM HPSI PUMP P41C
FROM HPSI PUMP P41B
FROM HPSI PUMP P41A
2-CH-429
2-CH-340
2-SI-653
2-SI-655
2-SI-656
2-SI-654
FROM LPSI
2-SI-616
2-CH-517 (L.C.)
TO PZR. AUX. SPRAY
2-SI-617
2-CH-519
2-SI-637
2-CH-518
2-SI-636
FROM LPSI
1 S/G
1A
1B
2A
2B
2 S/G
2-SI-626
2-SI-646
FROM LPSI
2-SI-627
FROM LPSI
2-SI-647
LETDOWN
2-CH-515

LEGEND:

▲ - SIAS CLOSE/STOP

△ - SIAS OPEN/START

● - CIAS CLOSE/STOP

——— - TRAIN 'A' OR COMMON FLOW PATH

NOTES:

1. VALVES OPEN ON LOW VCT LEVEL.
2. VALVE CLOSES ON LOW VCT LEVEL.
3. VALVE OPERATES ON PZR LEVEL CONTROL.
4. VALVE OPERATES ON PRESSURE CONTROL.

RE-GEN
HEAT
EXCHANGER

▲ ●
2-CH-516

REFERENCES:

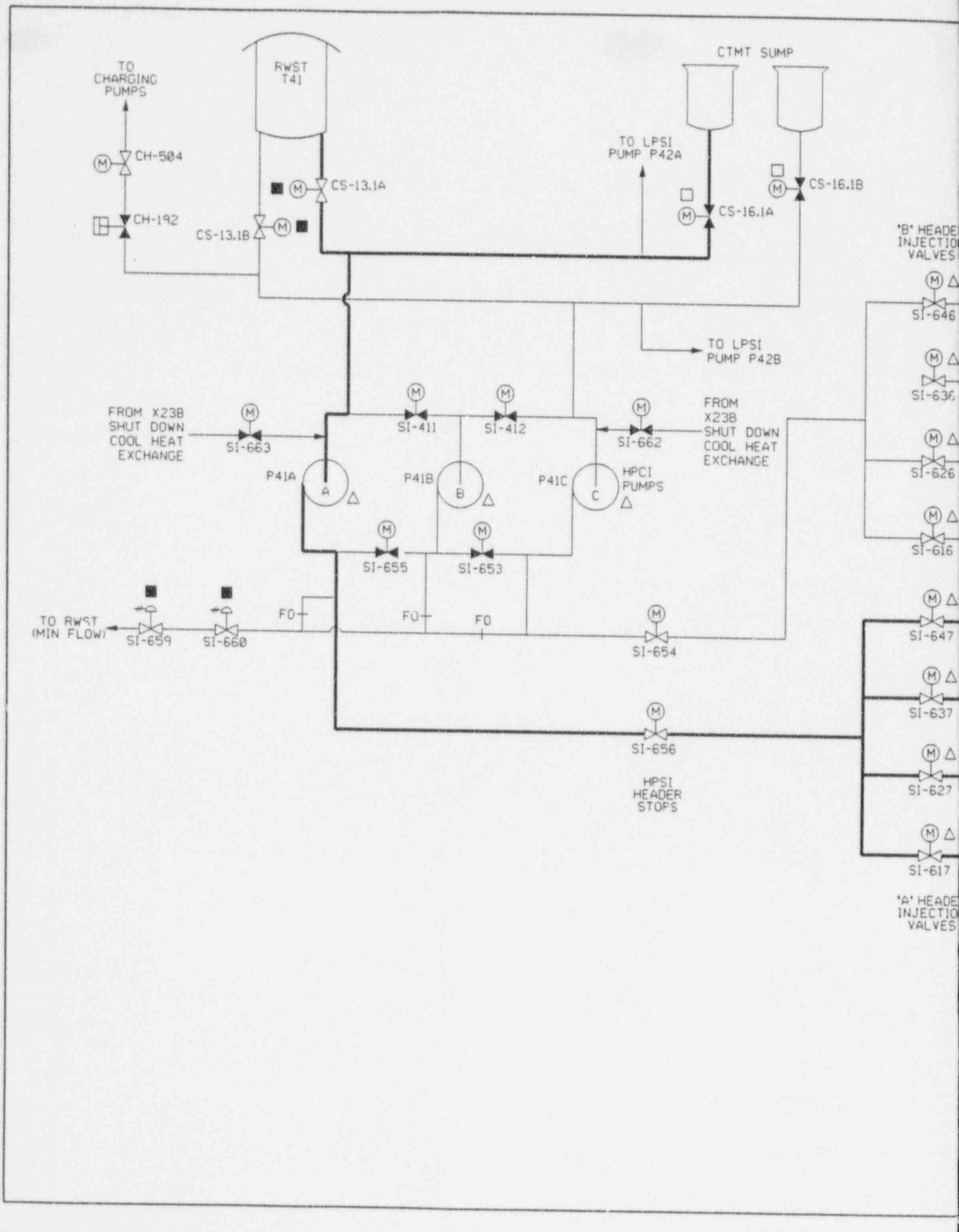
25203-26014.SH.1, REV.17
25203-26015.SH.2, REV.10
25203-26017.SH.1, REV.20
25203-26017.SH.3, REV.15
25203-26030.SH.1, REV.26

PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2SBD-CVCS1	Ø REV.
C.V.C.S.			

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
7/19/97	7/18/97	7/18/97
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE

PPGI-FILE: 526005:cvcs.dgn
PPGI-DATE: 18-Jul-97 12:17

9707220037-11

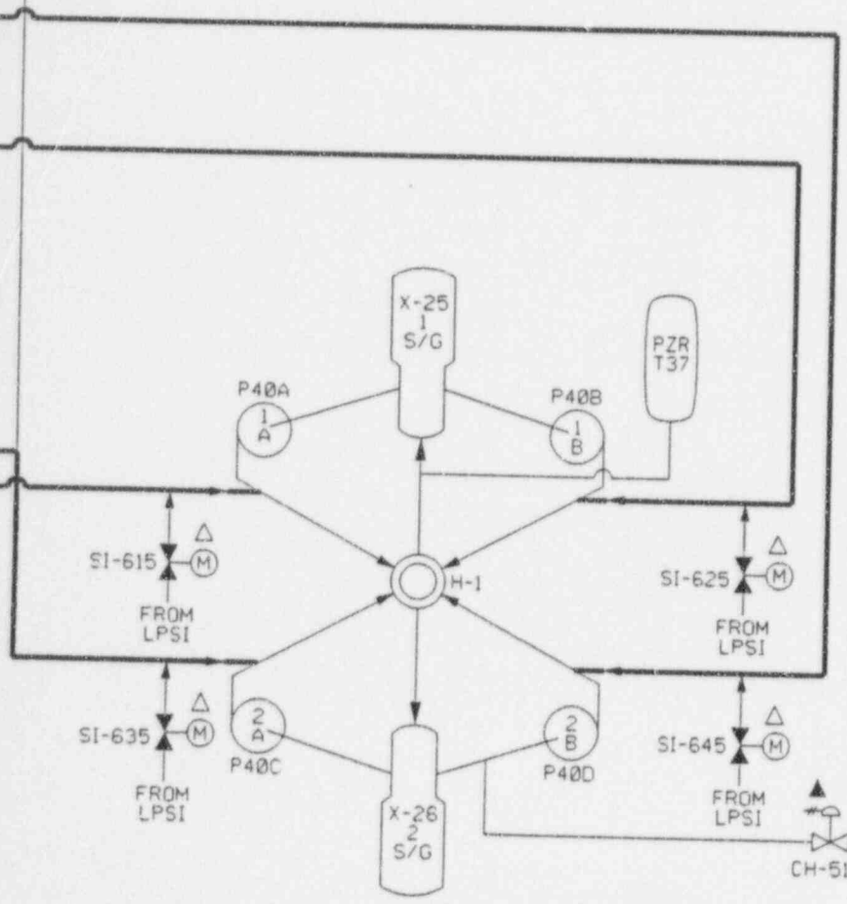

TO CHARGING PUMPS
CH-504
CH-192
RWST T41
CS-13.1A
CS-13.1B
CTMT SUMP
TO LPSI PUMP P42A
CS-16.1A
CS-16.1B
TO LPSI PUMP P42B
FROM X23B SHUT DOWN COOL HEAT EXCHANGE
SI-663
SI-411
SI-412
SI-662
FROM X23B SHUT DOWN COOL HEAT EXCHANGE
P41A
P41B
P41C
HPCI PUMPS
SI-655
SI-653
TO RWST (MIN FLOW)
SI-659
SI-660
FO
SI-654
SI-656
HPSI HEADER STOPS
'B' HEADER INJECTION VALVES
SI-646
SI-636
SI-626
SI-616
SI-647
SI-637
SI-627
SI-617
'A' HEADER INJECTION VALVES

LEGEND:

▲ - SIAS CLOSE/STOP
△ - SIAS OPEN/START
● - CIAS CLOSE/STOP
■ - SRAS CLOSE/STOP
□ - SRAS OPEN/START
▬ - TRAIN "A" OR COMMON FLOW PATH

NOTES:

ALL COMPONENT ID'S PRECEEDED BY "2-" UNLESS OTHERWISE NOTED



REFERENCES:

25203-26015 SHT 2 REV 10
25203-26015 SHT 1 REV 13
25203-26017 SHT 3 REV 15
25203-26014 SHT 1 REV 17

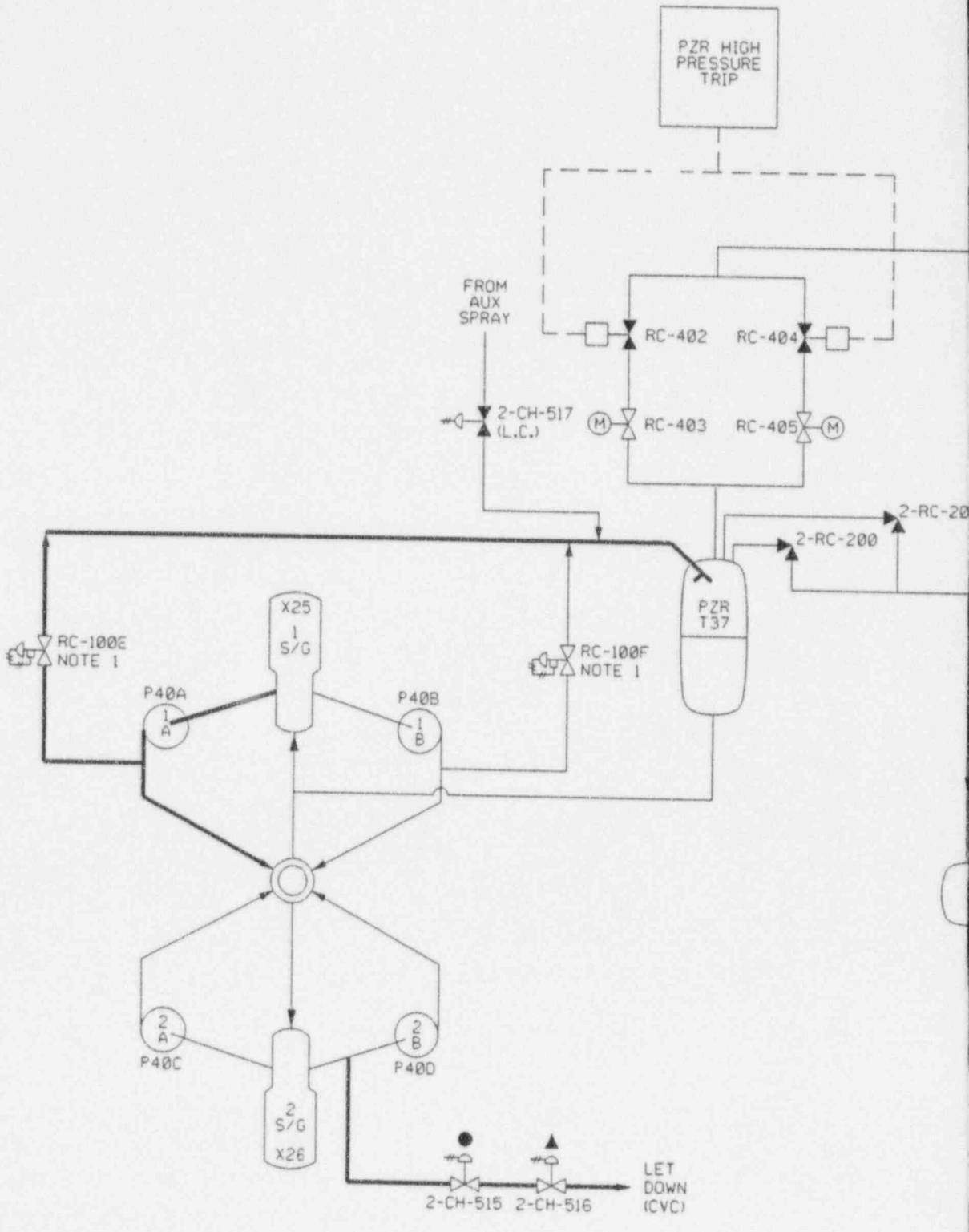
PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2SBD-HPSI1	0 REV.

H.P.S.I.

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
	R.S. Faust 7/18/97	7/18/97
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE

PPGI-FILE: 526005:hpsi.dgn
PPGI-DATE: 18-Jul-97 12:20

9707220037-12


PZR HIGH PRESSURE TRIP
FROM AUX SPRAY
RC-402
RC-404
2-CH-517 (L.C.)
RC-403
RC-405
2-RC-200
PZR T37
RC-100E NOTE 1
RC-100F NOTE 1
X25 1 S/G
P40A 1 A
P40B 1 B
2 A P40C
2 B P40D
2 S/G X26
2-CH-515
2-CH-516
LET DOWN (CVC)

LEGEND:

● - SIAS CLOSE/STOP

▲ - CIAS CLOSE/STOP

▬▬ - TRAIN 'A' OR COMMON FLOW PATH

NOTES:

1. PZR PRESSURE CONTROL.

REFERENCES:

25203-26014 SHT 2 REV 13
25203-26014 SHT 1 REV 17
25203-26017 SHT 2 REV 17
25203-26017 SHT 1 REV 20

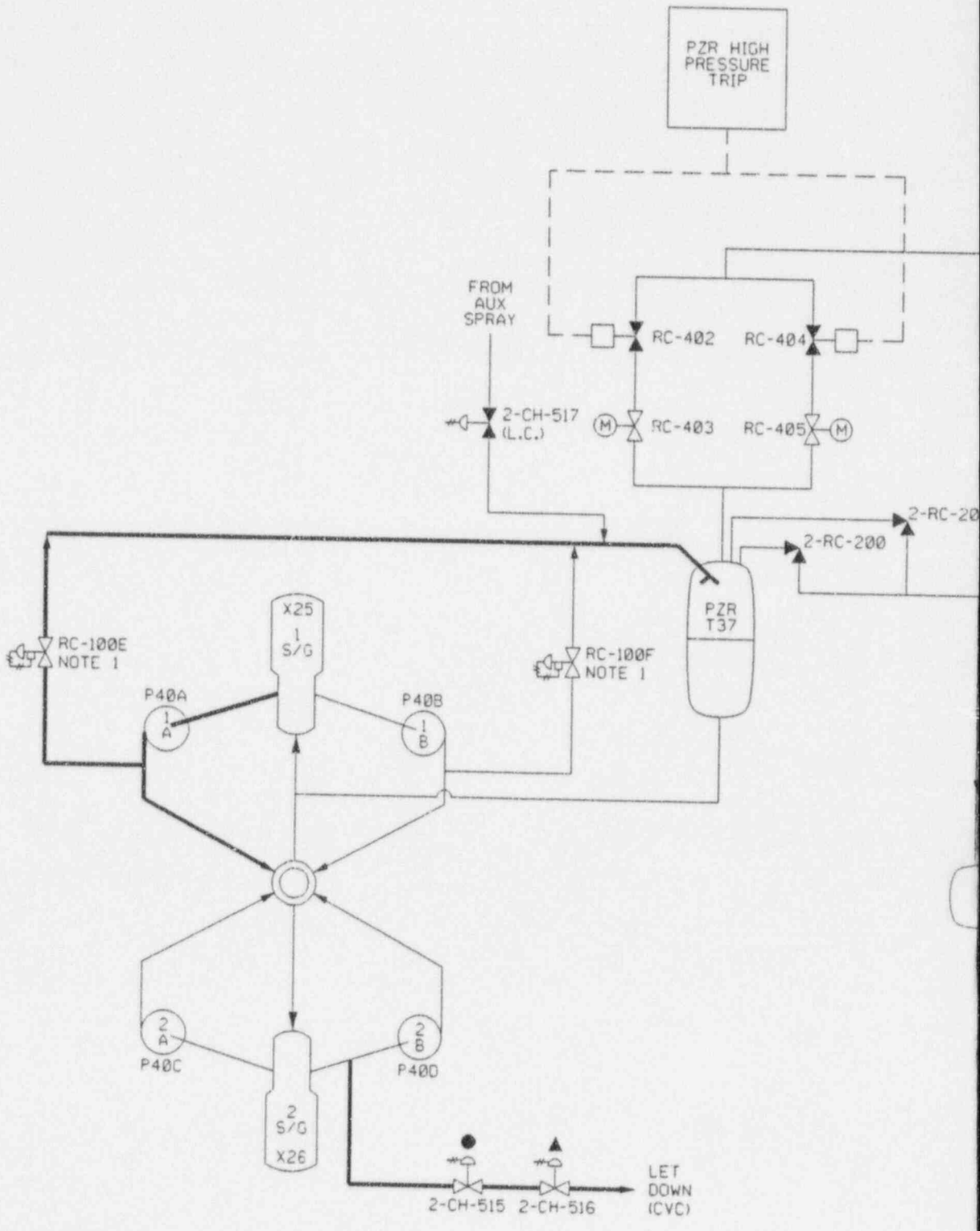
UENCH
TANK
T38

PARSONS PARSONS POWER GROUP INC. READING / BOSTON / CHARLOTTE / CHATTANOOGA	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2SBD-RCS1	0 REV.
RCS			

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
7/18/97	R S Faust 7/18/97	7/18/97
N/A	N/A	N/A
INTERFACE DATE	INTERFACE DATE	INTERFACE DATE

PPGI-FILE: 526005rcs.dgn
PPGI-DATE: 18-Jul-97 12:25

9707220037-13


PZR HIGH PRESSURE TRIP
FROM AUX SPRAY
RC-402
RC-404
2-CH-517 (L.C.)
RC-403
RC-405
2-RC-200
PZR T37
RC-100E NOTE 1
RC-100F NOTE 1
X25 1 S/G
P40A 1 A
P40B 1 B
2 A P40C
2 B P40D
2 S/G X26
2-CH-515
2-CH-516
LET DOWN (CVC)

LEGEND:

● - SIAS CLOSE/STOP

▲ - CIAS CLOSE/STOP

—— - TRAIN 'A' OR COMMON FLOW PATH

NOTES:

1. PZR PRESSURE CONTROL.

REFERENCES:

25203-26014 SHT 2 REV 13
25203-26014 SHT 1 REV 17
25203-26017 SHT 2 REV 17
25203-26017 SHT 1 REV 20

QUENCH TANK T38

PARSONS POWER GROUP INC.	536852-00085 WORK ORDER NO.	TIER 2 FIGURE #M2-T2SBD-RCS1	Ø REV.
RCS			

ORIGINATED DATE	REVIEWED DATE	APPROVED DATE
7/14/97	R Faust 7/18/97	R Glavano 7/18/97
N/A INTERFACE DATE	N/A INTERFACE DATE	N/A INTERFACE DATE

PPGI-FILE: 526005:rcs.dgn
PPGI-DATE: 18-Jul-97 12:25