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TECHNICAL REPORT
A-3453-87-6

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WASHINGTON NUCLEAR PLANT NO. 2 GENERIC PROBABILISTIC RISK ASSESSMENT-BASED INSPECTION PLAN

Prepared by:

J. Taylor, A. Fresco, M. Villaran, W. Gunther, & R. Lewis
Engineering Technology Division

Department of Nuclear Energy
Brookhaven National Laboratory
Upton, N.Y. 11973

June 1987

Prepared for the U.S. Nuclear Regulatory Commission

FIN A-3453

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1. INTRODUCTION

The tables and paragraphs in this inspection plan have been prepared to provide inspection guidance and have been based on a review of the following:

1) previously prepared PRA based system inspection plans (1-4),
2) prior generic studies (5,6),
3) ASEP (7), and GESSAR (8).

The guidance should be used to aid in the selection of areas to inspect and is not intended either to replace current I&E inspection guidance or to constitute an additional set of inspection requirements. In using this information one should realize that it is based primarily on prior PRA work. Hence, recent system experience, failures, and modifications should be considered when using these tables. Since plant modifications are normally an ongoing continual process, it is recommended that relevant changes be catalogued so that these inspection plans can be periodically revised as required.

2. SYSTEM PRIORITY LIST

The grouping on WNP-2 systems into three groups is based on the importance of these systems as demonstrated in 9 BWR PRA's, and as modified for the WNP-2 specific plant design. Systems were considered of high importance if they were one of the dominant contributors to core melt or high offsite consequences. Within each group, no relative ranking has been done. Systems that do not appear in any of the three groups were deemed of lesser importance than those that were ranked.

3. DOMINANT ACCIDENT INITIATORS AND SEQUENCES

The following dominant accident initiators and sequences are ranked in order of importance:

Initiators:

1. Loss of offsite power.
2. Major transients in power conversion system (PCS), such as turbine trip, loss of FW, MSIV closure, etc.

Sequences:

1. Station blackout.
2. ATWS.
3. Transient, coupled with failure of PCS, loss of HPCS and RCIC, ADS failure.
4. Transient plus failure of long term RHR.
5. Interfacing systems LOCA.

4. SYSTEM INSPECTION TABLES

Three tables have generally been prepared for each system to provide inspection guidance. These tables are described below (see Table 1).

Table X-1 - Failure Modes

Those components or licensee activities which play a dominant role in contributing to system importance are presented, along with a brief description of why these items are important. Inspection focus on these items ~~will~~ should typically address >75% of the risk significant areas. For experienced inspectors, this table is probably sufficient. A simplified system diagram extracted from the WNP-2 Training Manuals is included for each system, which gives the valve numbers used.

Table X-2 - I&E Procedures

For those who prefer additional guidance, this table identifies those I&E inspection procedures which can be used to assure the availability of the items shown in Table 2. The inspection procedures were identified based on the failure modes presented and an understanding of I&E procedures. The procedures selected are those which provide routine guidance on the principal plant programmatic activities such as operations, maintenance, instrumentation/control and surveillance testing. There are many other inspection procedures which could also be used depending on the inspection criteria or the inspector's preference. However, the procedures selected will generally provide adequate inspection coverage of the dominant failure modes.

Table X-3 - Modified System Walkdown

This table provides an abbreviated version of the licensee's system checklist, but includes only those items which are related to the dominant failure modes. It is generally less than one third (sometimes only 1/10) of the normal checklist. Caution should be observed when using the checklists, since they are based on certain versions of the licensee's checklist. The revision date of the licensee's checklist that was used is indicated at the end of Table X-3.

Systems Importance Ranking

High Importance

Electric Power (AC & DC)
Reactor Protection System (RPS)
Service Water (SW)
Primary Containment (Includes Supp. Pool, DW Spray)
High Pressure Core Spray (HPCS)
Reactor Coolant Isolation Cooling (RCIC)
Automatic Depressurization System (ADS)
Residual Heat Removal (RHR) System

Medium Importance

Low Pressure Core Spray (LPCS)
Power Conversion System (PCS)
Standby Gas Treatment (Including RX Bldg Integrity)
Main Steam Isolation Valves (MSIVs)
Recirculation Pump Trip (RPT)

Low Importance

Standby Liquid Control (SLC)
Reactor Closed Cooling (RCC) *
Low Pressure Coolant Injection (LPCI)

* Normally this system is at least of low importance at other BWRs. However, at WNP-2, no safety-related loads are serviced by this system so that no inspection plan is [illegible].

REFERENCES

1. A. Fresco, et al., "Limerick Generating Station Unit 1, Probabilistic Risk Assessment-Based System Inspection Plans," Brookhaven National Laboratory Technical Report A-3453-87-2, Rev. 0, May 1987.

2. A Fresco, et al., "Shoreham Nuclear Power Station Probabilistic Risk Assessment-Based System Inspection Plans," Brookhaven National Laboratory Technical Report A-3453-87-3, Rev. 0, May 1987.

3. J. Higgins, R. Fullwood, A. Coppola, "DRAFT Millstone Nuclear Power Station Unit 1 Probabilistic Risk Assessment-Based System Inspection Plans," Brookhaven National Laboratory Technical Report A-3453-3-87, Rev. 0, March 1987.

4. J. Usher, A. Fresco, "Draft Grand Gulf Nuclear Station Unit 1 Probabilistic Risk Assessment-Based System Inspection Plans," Brookhaven National Laboratory Technical Report A-3453-4 Draft, May 1987.

5. N.A. Hanan, et al., "A Review of BWR/6 Standard Plant (GESSAR) Probabilistic Risk Assessment: Vol. 1 - Internal Events, Core Damage Frequency," NUREG/CR-4135P, Volume 1, Brookhaven National Laboratory, May 1985.

6. J.C. Higgins, "Generic PRA-Based BWR Insights," Brookhaven National Laboratory Technical Report A-3453-9-86, September 1986.

7. "ASEP Methodology Guideline for the Rebaselining of the NRC Reference Plants, Table 4 - BWR Accident Sequence Insights," Draft, September 1985.

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Electrical Power Distribution System

TABLE EP-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic testing and/or preventive or unscheduled maintenance activities and procedures and/or normal and emergency operating procedures, training, and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
TS - Technical specifications.

Mission Success Criteria

Later

Failure Conditions

A. Alternating Current (AC) Power Distribution System (Includes Standby AC Power System & 120V/240V Uninterruptible Power Sypply System)

The dominant AC system failures are Item 1 combined with any one item from Items 2-5.

1. Loss of normal power (TR-N1, TR-N2) and failure to transfer to startup (TR-S) or backup (TR-B) source (failure of main generator lockouts or bus transfer breakers) or isolation of 6900V and 4160V AC buses from grid (system or switchyard problem) requiring emergency diesel generators (EDGs) to be started (PT,OP);

AND

TABLE EP-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

2. Failure of EDGs (DGs 1,2 and 3) caused by (PT,MT):

   a) Failure to start or run, or
   b) Failure or degradation of room ventilation, or
   c) Loss of service water cooling, or
   d) Failure to restore components after test or maintenance.

OR

3. Failure of undervoltage relays that sense loss of offsite power and send start signal to EDGs (PT).

OR

4. Various circuit breaker faults (PT):

   a) Failure of circuit breakers to close that tie emergency buses to sources of emergency power
   b) Failure of circuit breakers to open that isolate failed sources of power

OR

5. Failure of operators to take appropriate recovery actions (OP):

   a) Failure to recover de-energized buses
   b) Failure to manually start EDGs

6. Failure of 120V vital Ac inverters and failure of automatic transfer via static switch from inverter to alternate source of AC power. (MT,PT)

B. Direct Current (DC) Power Distribution System

1. Failure of battery charger or in maintenance: (PT,MT)

   a) 125V DC, chargers C1-1, C1-2, C1-HPCS
   b) 250V DC, Charger C2-1

2. Failure of batteries due to: (PT,MT)

   a) Insufficient charge
   b) Loss of battery room ventilation

3. Operational Test or Maintenance Error Resulting in: (PT,MT,OP)

   a) Deenergizing, or cascade failure of DC power supplies
   b) Failure to properly restore batteries or charger after maintenance or testing.

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TABLE EP-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS*	FAILURE MODES
41700	Training	Offsite power sources, diesel-generators, switchgear, transformers, battery sets, chargers, breakers	All
61725	Surveillance Testing and Calibration Program	Offsite power sources, diesel-generators switchgear, transformers battery sets, chargers, breakers	A:1-4,6 B:1-3
61726	Monthly Surveillance Observation		
71707	Operational Safety Verification		
71710	ESF System Walkdown		
62702	Maintenance (refueling)	Diesel-generators, switchgear, battery sets, chargers	A:2,6 B:1-3
62703	Monthly Maintenance Observation		

~~*Refers only to components identified in Tables [illegible] and [illegible]~~

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TABLE EP-3 MODIFIED SYSTEM WALKDOWN

Control Room

Verify that power is available to or from the following:

1. From the off-site power sources

   25kV through TR-N1 from the ASHE substation _____
   230kV through TR-S from the ASHE substation _____
   115kV through Tr-B from the Benton substation _____

2. To the three 4KV busses

   SM-4 _____
   SM-7 _____
   SM-8 _____

3. To the five 480V busses

   SL-71 _____
   SL-73 _____
   SL-81 _____
   SL-83 _____
   MC-4A _____

4. To the three 125V DC busses

   S1-1 _____
   S1-2 _____
   125V DC HPCS distribution panel _____

5. Verify that all diesel generator alarms are cleared _____

Diesel Generator Rooms

Verify the following:

1. DG local/remote selector switch is in remote position.
2. Ventilation fan switches are in Auto or Standby.
3. Governor oil level is satisfactory.
4. Air receiver tank pressure is ____ psig.
5. Fuel oil day tank level is satisfactory ____gallons or ____feet.
6. Electric immersion heater is operating correctly to maintain the engine jacket cooling water at 125°F when the engine is not running.
7. AC motor-driven water circulation pump, for moving the water through the jacket cooling water system when the engine is not running, is operating properly.

TABLE EP-3 (Cont'd)

Critical 120V AC and Uninterruptible Power Supply Systems

Verify power is available from the following sources:

IN-1

1. Normal AC MC-7A _____
2. Normal DC DP-52-1 _____
3. Alternate AC MC-7F _____
4. Bypass AC MC-7A _____

IN-2

1. Normal DC DP-51-2 _____
2. Alternate AC MC-8A _____

IN-3

1. Normal DC DP-51-1 _____
2. Alternate AC MC-7A _____

125V/250V Direct Current (DC) Power Distribution System

Power Supply	Description	Required Position	Actual Position
MC-7A/BKR-4A	480V Supply to C2-1	Closed	
MC-7A/BKR-1B	480V Supply to C1-1	Closed	
MC-8A/BKR-1C	480V Supply to C1-2	Closed	
MC-4/BKR	480V Supply to C1-HPCS	Closed	
	AC Input BKR C2-1	Closed	
	AC Input BKR C1-1	Closed	
	AC Input BKR C1-2	Closed	
	AC Input BKR C1-HPCS	Closed	
	DC Output BKR C2-1	Closed	
	DC Output BKR C1-1	Closed	
	DC Output BKR C1-2	Closed	
	DC Output BKR C1-HPCS	Closed	
	Battery Output Disconnect B1-1	Closed	
	Battery Output Disconnect B1-2	Closed	
	Battery Output Disconnect B1	Closed	
	Battery Output Disconnect B2-1	Closed	

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TABLE EP-4 PROPOSED INSPECTION PLAN FOR DIESEL GENERATORS AT NUCLEAR PLANTS

A. Objective

To review and evaluate Diesel Generator design operation, and maintenance at NPPs to ensure that the DGs will be available when needed to power safety systems.

B. Details

1. The inspection of the following items should focus on DG auxiliary systems as follows: Fuel Injection System, Turbocharger, Starting System, Speed/Load Control, Jacket Water, Cooling Water, Lube Oil, Fuel Oil, Control and Monitoring Systems, and Generator.

2. Using the LER, 50.55e, and Part 21 systems computer printout, select 3 recent failures (within 2 years) for followup at the NPP. When at the plant select an additional 2 failures from the internal systems. Evaluate the licensee's response to these failures for proper failure analysis, corrective action, notification of vendor, Part 21 evaluation and documentation.

3. Maintenance: Refer to IE I.P.s 62700 and 62702, as they apply to DG maintenance. Additionally, does the NPP have, and have they implemented the DG vendors' maintenance recommendations (especially those recommendations unique to nuclear service DGs such as Colt's described in NSAC-79)? Are maintenance personnel specially trained on DGs? Is failure information fed back into maintenance program? Has the NPP implemented recommendations of various studies referenced in Section 4 above.

4. Design Change Control: Select two DG modifications and verify proper implementation. Utilizing information from DG vendor inspection on modifications recommended, verify that NPP is receiving all pertinent information in this area from the vendor. (Reference IE I.P. 37700).

5. Spare Parts and Procurement: Review how spare parts and services are purchased and parts stored, both from DG vendor and direct from subvendor. Verify adequate Part 21 and QA, particularly when vendors are only supplying commercial grade parts and services (e.g., Woodward Governor and Stewart and Stevenson). Verify ASME code specified where appropriate. Tour spare parts storage area. (Reference IE I.P. 38701B).

TABLE EP-4 (Cont'd)

6. Training: Ensure appropriate DG specific training given to maintenance, operations, QA, and management personnel. Are there adequate documents to describe DG operation onsite (both main engine and auxiliary system)? (Reference IE I.P. 41700).

7. Observe DGs in operation. Ensure they run smoothly and are operated per procedure. Look for abnormal vibration and leaks (air, fuel oil, or lube oil). Check that readings are within specified limits. Are limits per DG vendor recommendations? Are recommendations clearly specified? Is air quality in DG room satisfactory without excessive dust? Are control cabinets properly gasketed? Are instruments calibrated? Is trending of operating data performed to detect degradation early?

8. Is NPP receiving all appropriate service information from vendor: design, maintenance, operational, etc? This is especially important for General Motors DG owners (verify they receive "Power Pointers" from GM).

9. Review site practices to limit DG cold fast starts.

10. Reliability records and calculations: Check logs, procedures, and calculations versus Reg. Guide 1.108 criteria.

11. Ensure that pertinent studies on DG performance have been reviewed and recommendations implemented as appropriate (e.g., NUREG/CR-0660 and NSAC-79).

12. Torquing: Ensure plant has adequate specifications for all torquing. Ensure it is documented and done with calibrated equipment. Observe re-torquing if in progress.

Source

J.C. Higgins and M. Subudhi, "A Review of Emergency Diesel Generator Performance at Nuclear Power Plants," NUREG/CR-4440, Brookhaven National Laboratory, November 1985.

References

1. NSAC-79, "A Limited Performance Review of Fairbanks Morse and General Motors Diesel Generators at Nuclear Plants," Nuclear Safety Analysis Center, Electric Power Research Institute, April 1984.

2. G. Boner and H. Hanners, "Enhancement of Onsite Emergency Diesel Generator Reliability," NUREG/CR-0660, University of Dayton, February 1979.

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TABLE EP-5 PROPOSED INSPECTION PLAN FOR CRITICAL 120V AC & UNINTERRUPTIBLE POWER SUPPLY SYSTEMS

1. Ensure that periodic verification of the system line-up of normal AC and DC power supplying the inverters and the availability of alternate power sources occurs. In particular, check that the "IN SYNCH LIGHTS/ON" are powered.

2. Verify that there is a periodic operability check (during refuelings) of the auto transfer switch capability.

3. Verify that procedures for the start of the GE computer specify switchover to an alternate power source when placing the computer on line and restoration to normal when the computer is on line.

4. Review the alarm response procedures for the UPS.

5. Verify the adequacy of the procedure for pre-charging of the inverters.

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TABLE EP-6 PROPOSED INSPECTION PLAN FOR DIRECT CURRENT (DC) POWER DISTRIBUTION SYSTEM

General

1. Review the alarm response procedures to ensure that timeliness of response is emphasized.

2. Verify that all appropriate actions are specified when a charger or battery is removed from service.

3. Ensure that there are no ties between DC divisions. In particular, verify that procedures are clearly defined for placing the spare charger for the 125V DC system into service without cross-tying between divisions.

Batteries

1. Review periodic surveillance and testing of:

   - Battery capacity (2 hours minimum) _____
   - Electrolyte level _____
   - Specify gravity _____

2. Check the blown fuse indicator between the battery and the distribution panel.

3. Ensure that all seismic supports are in place.

Chargers

1. Review periodic capacity test to ensure that it reflects expected loads and recharging of batteries within 24 hours.

2. Verify calibration and functional testing of charger alarms.

3. Review the alarm response procedures for emphasis on timeliness in restoring chargers to service, actions to take on low DC voltage, etc.

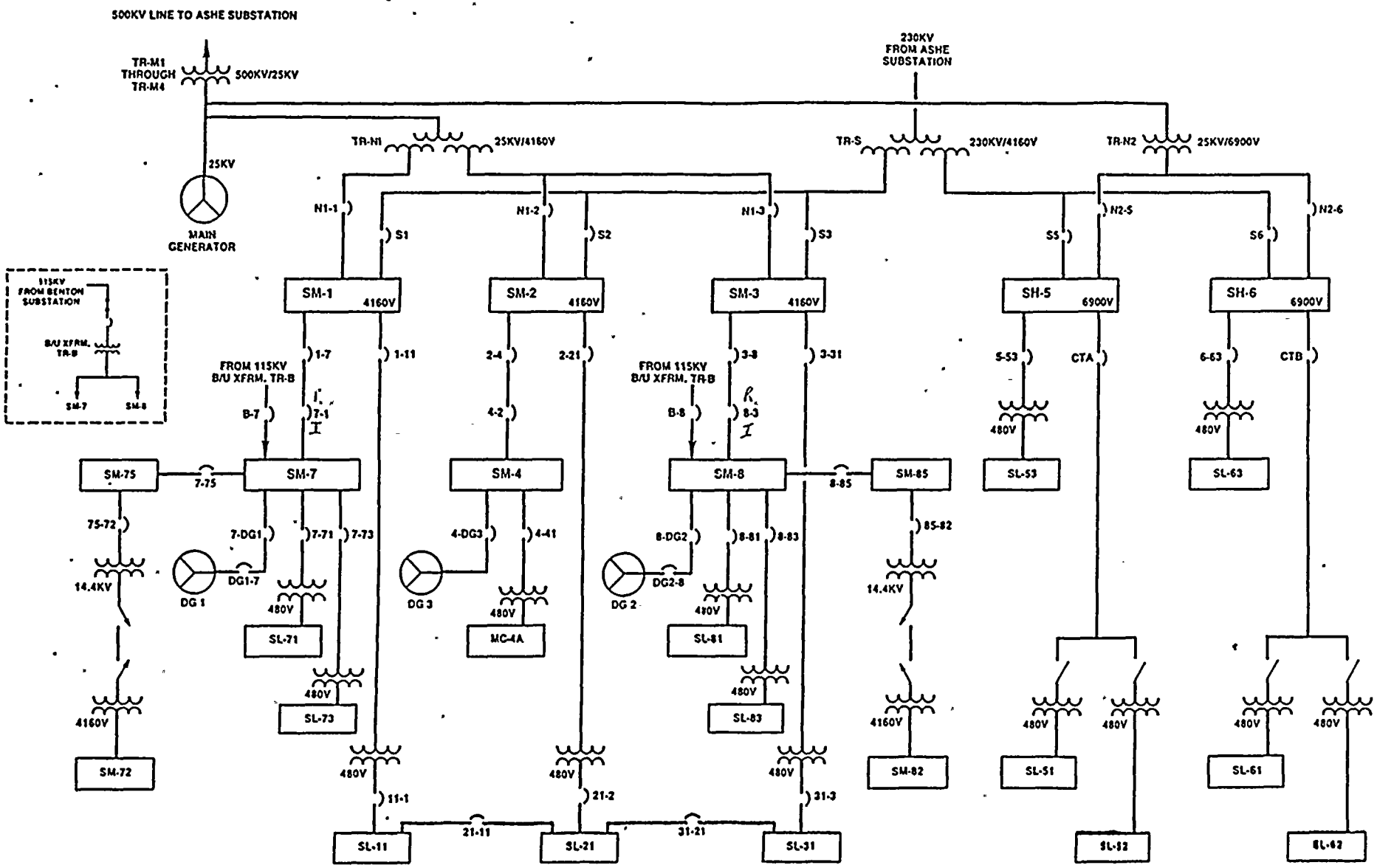

FIGURE 1 A C. DISTRIBUTION

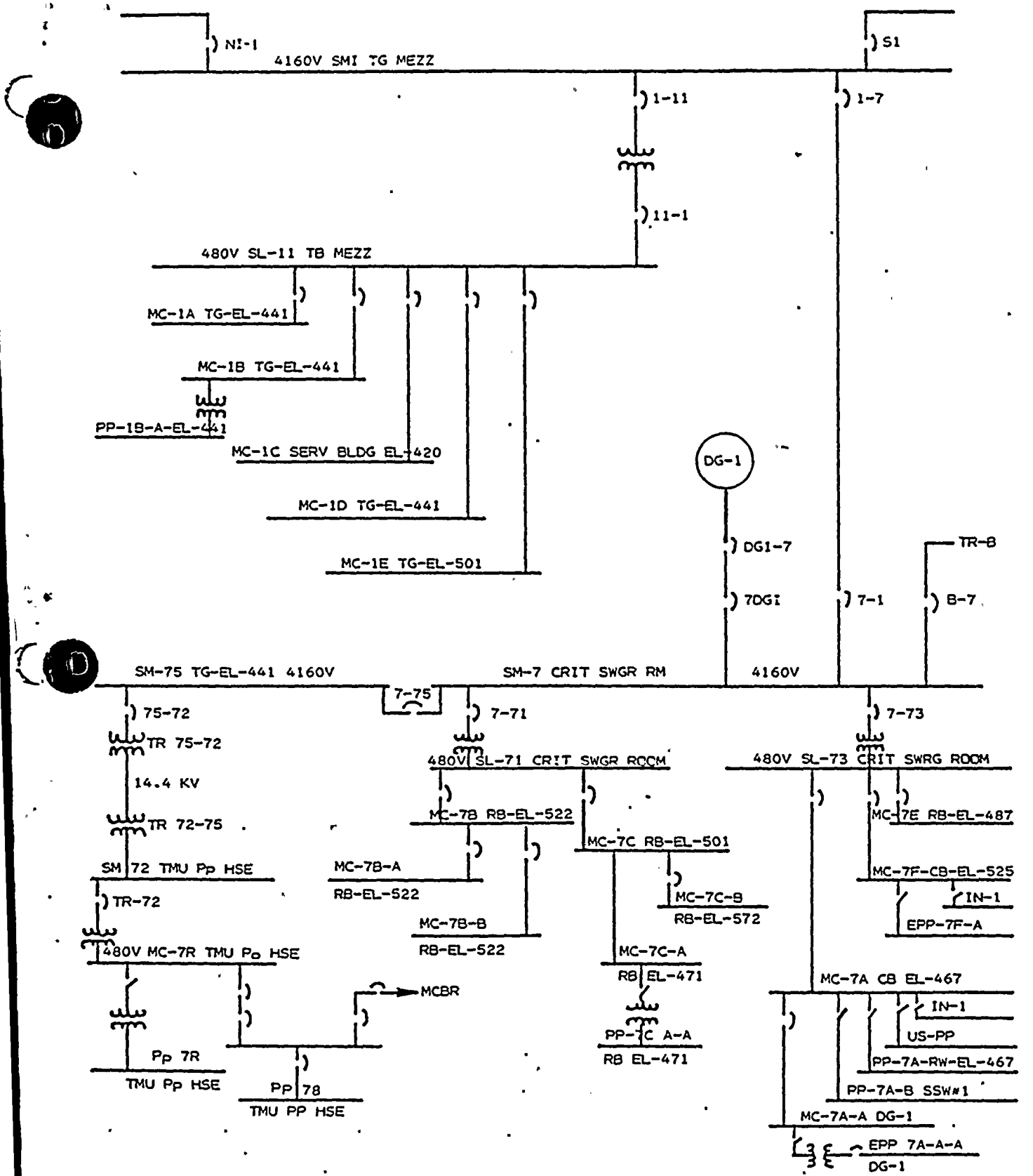

FIGURE 1A. AC DISTRIBUTION (A)

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MARCH 1984

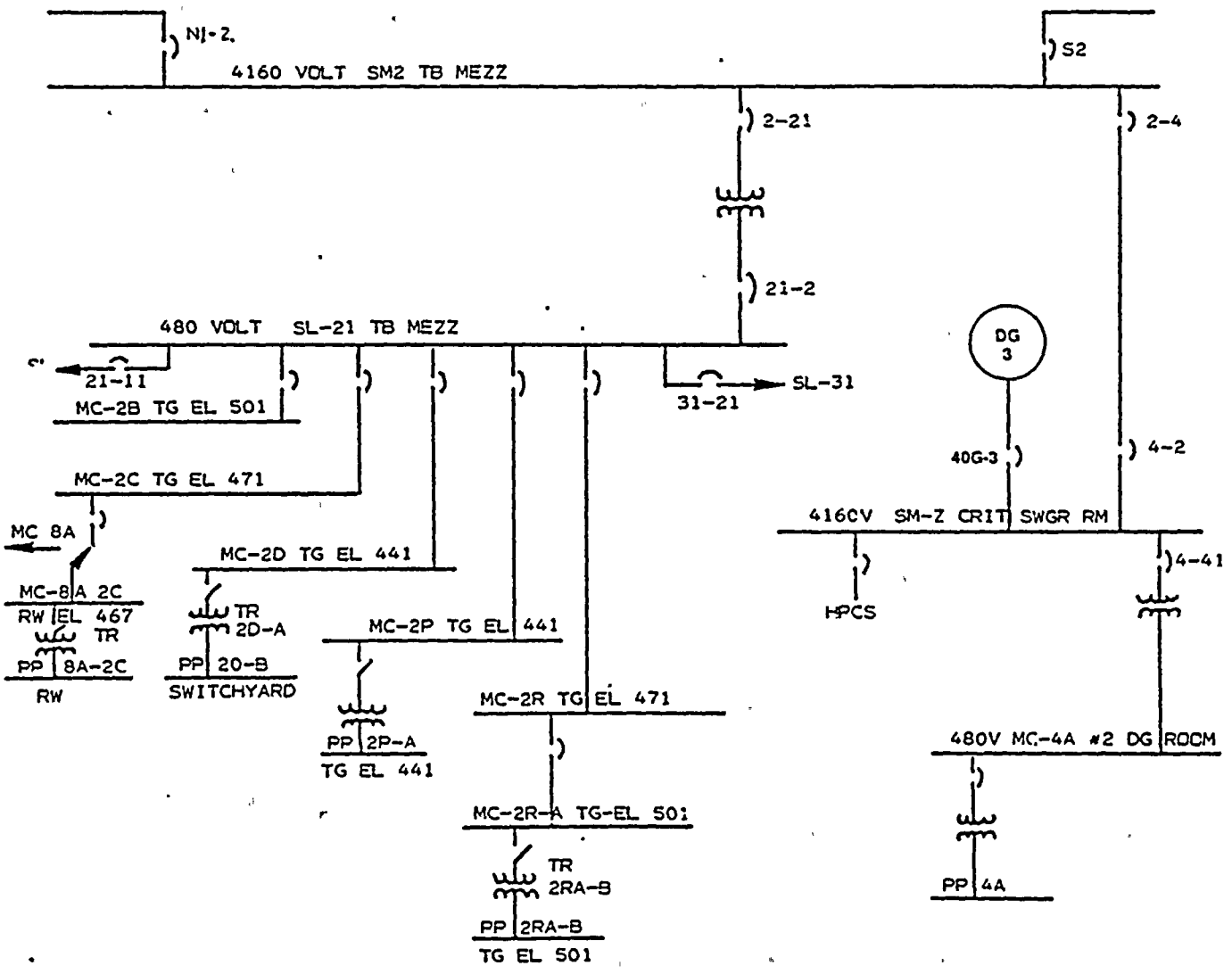

FIGURE 1B. AC DISTRIBUTION (B)

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MARCH 1984

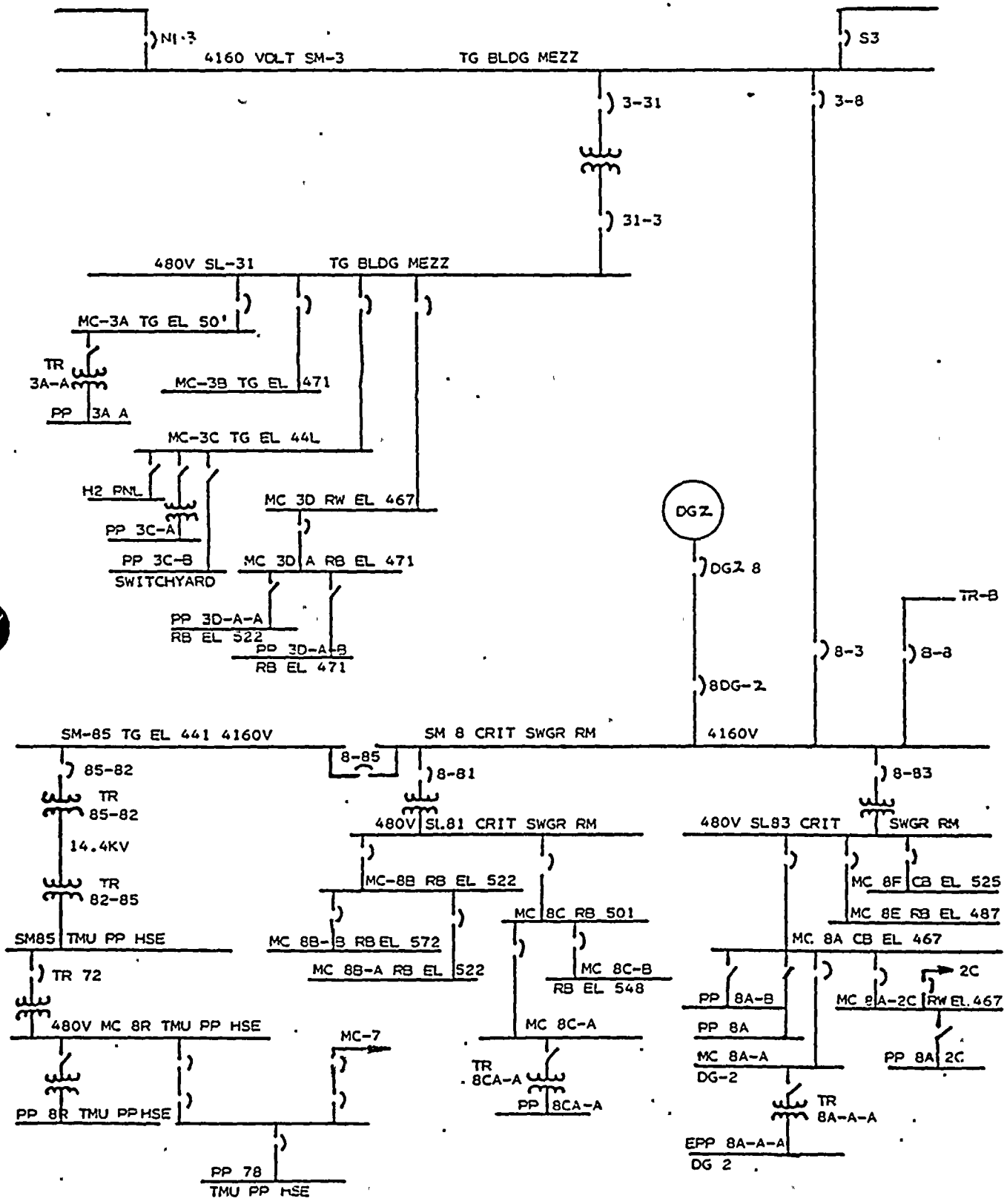

FIGURE 1C. AC DISTRIBUTION (C)

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MARCH 1984

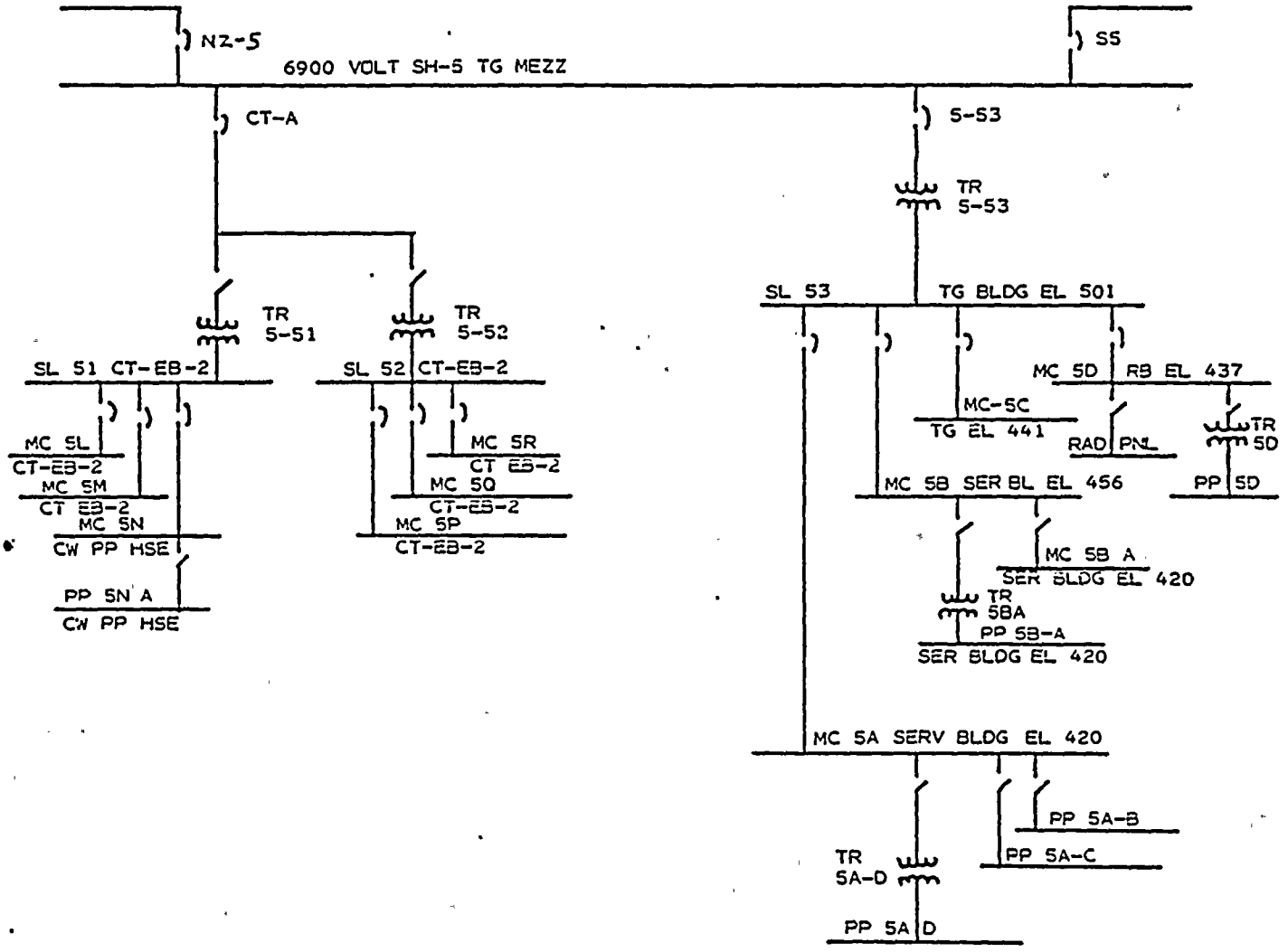

FIGURE 1D. AC DISTRIBUTION (D)

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MARCH 1984

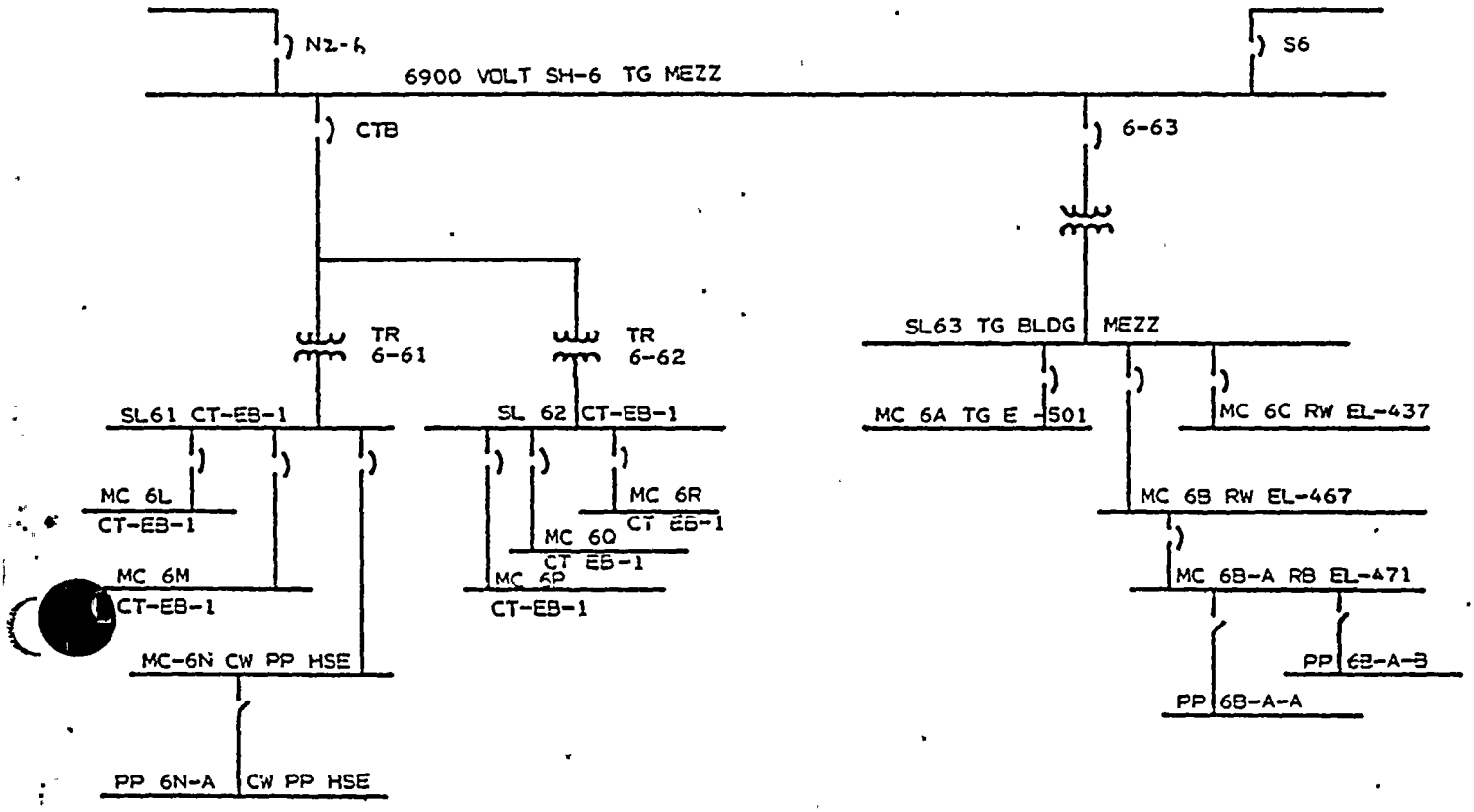

FIGURE 1E. AC DISTRIBUTION (E)

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MARCH 1984

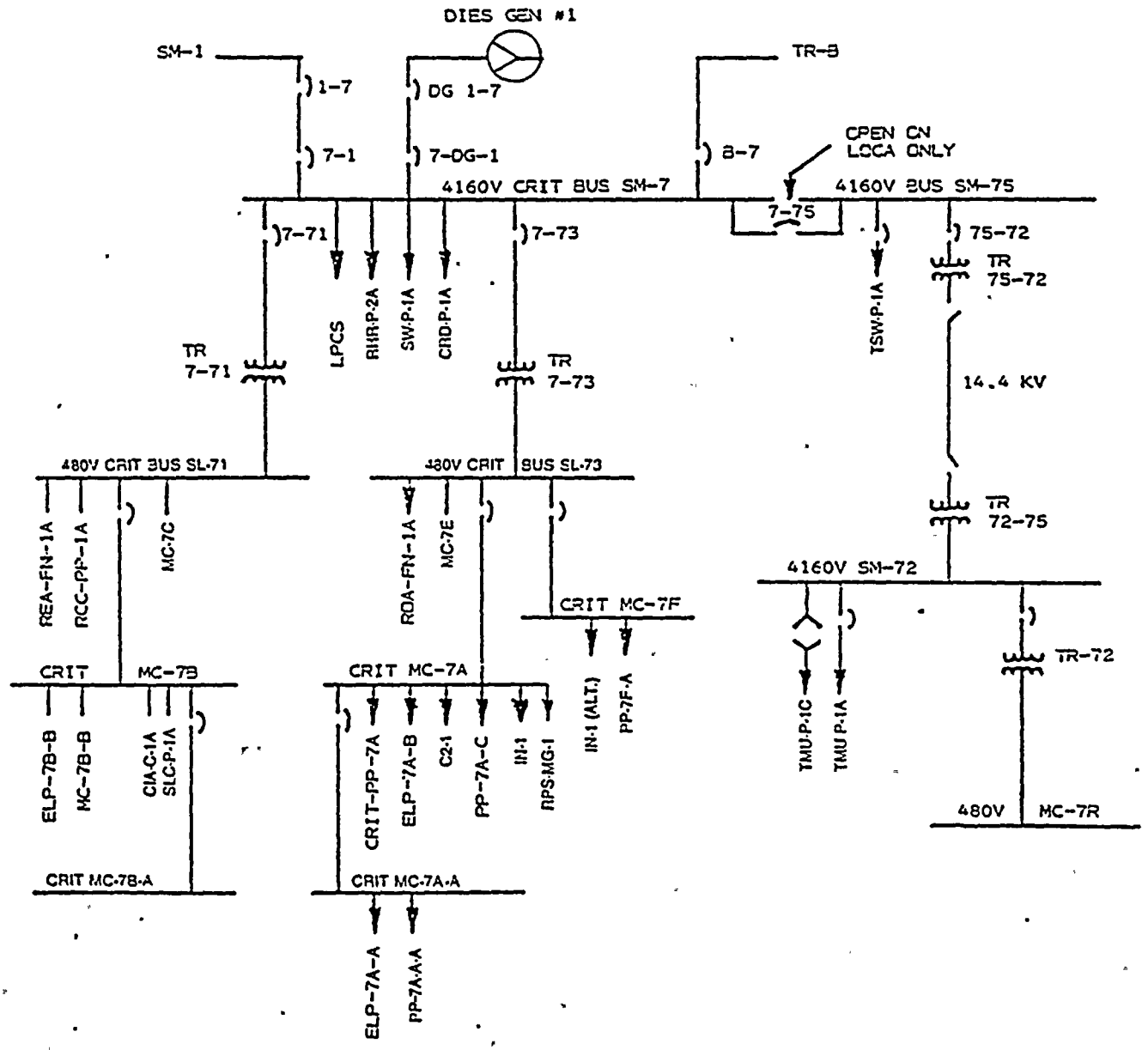


FIGURE 2 CRITICAL POWER SUPPLY DIVISION 1

840305.18A
MAY 1985

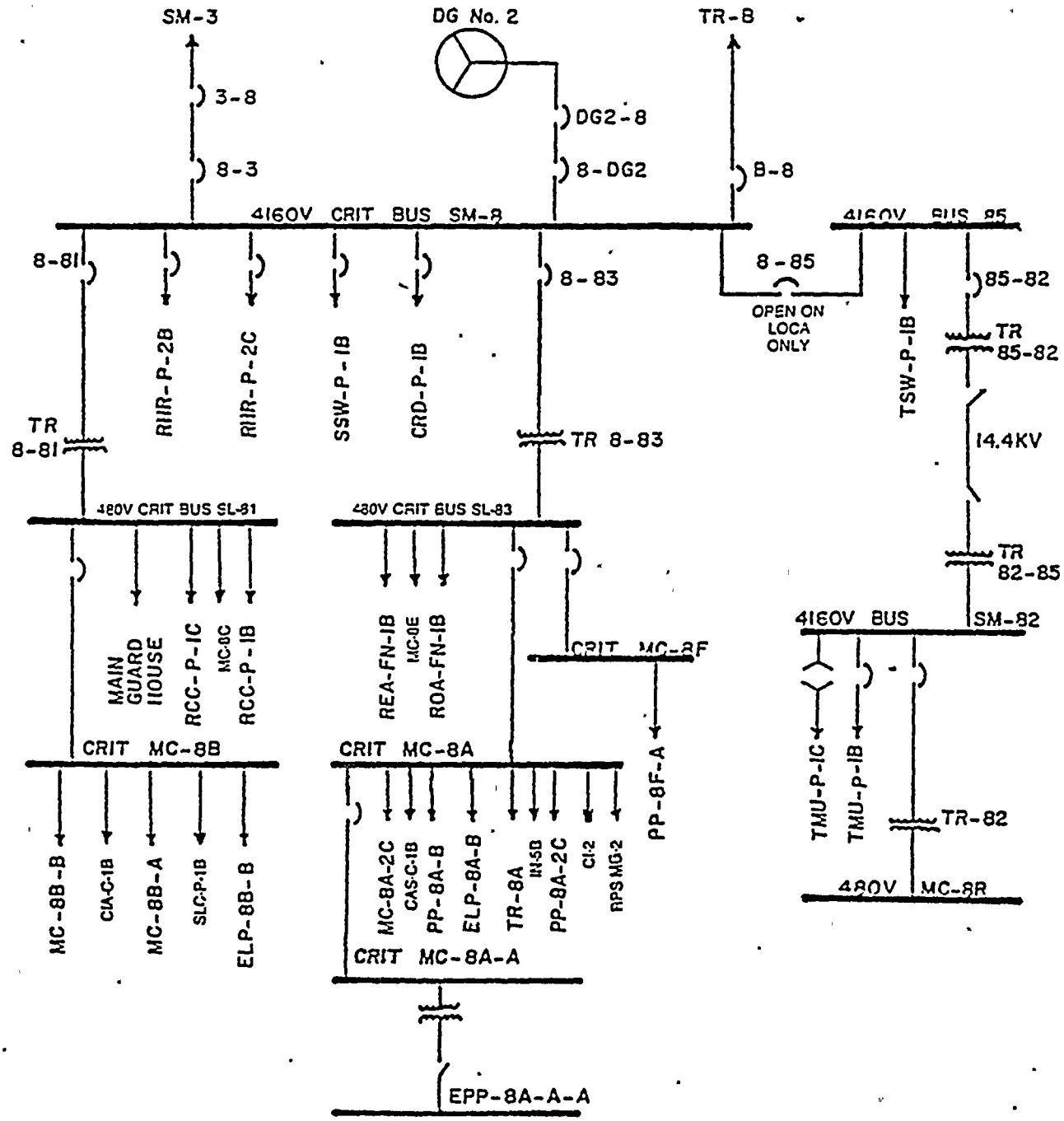


FIGURE 3 DIVISION 2 CRITICAL POWER SUPPLY

840205.20A
MAY 1985

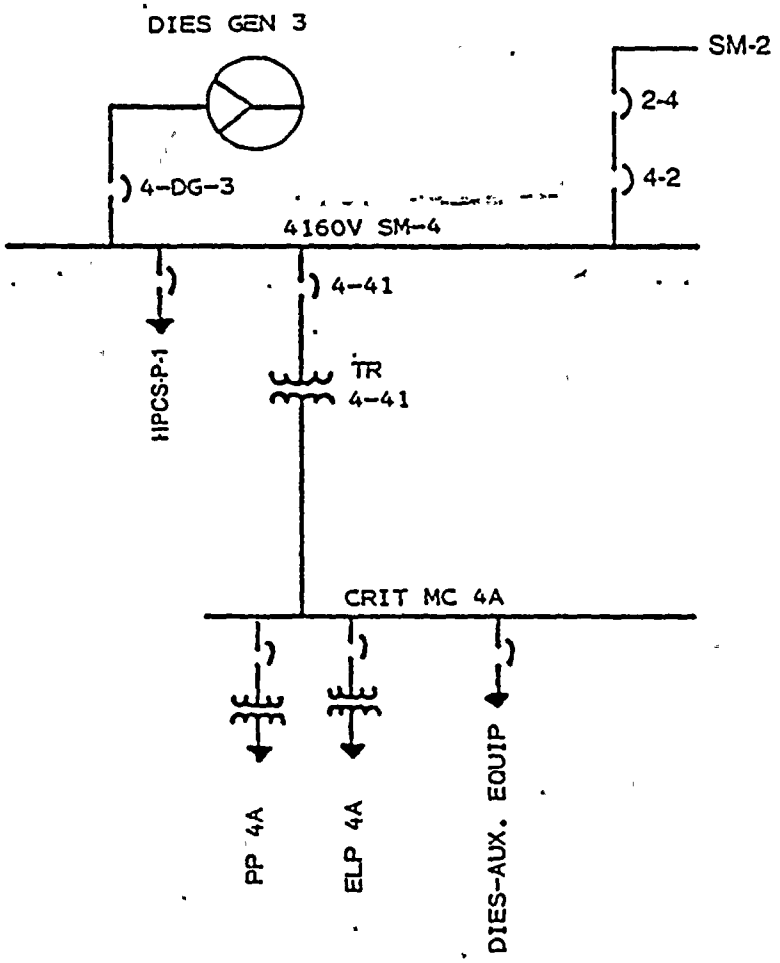
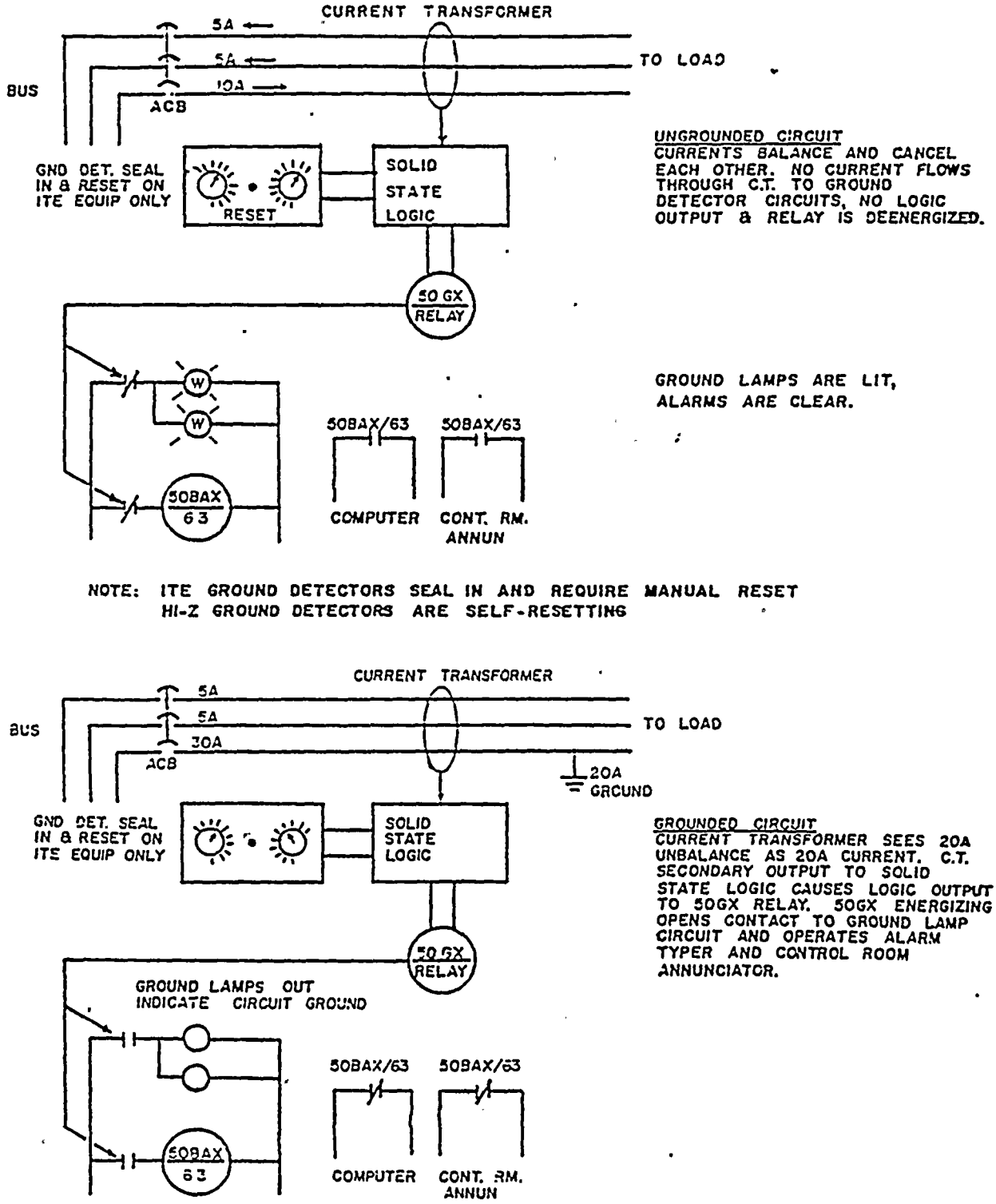


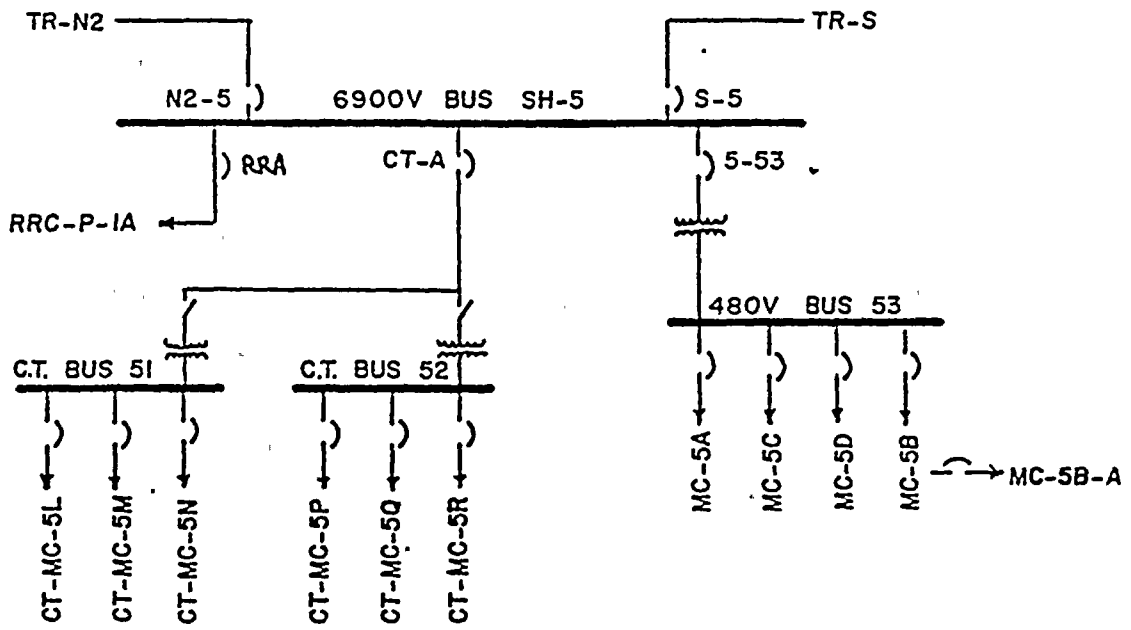
FIGURE 4 CRITICAL POWER SUPPLY DIVISION 3

840305.19A
JAN 1986



NOTE: ITE GROUND DETECTORS SEAL IN AND REQUIRE MANUAL RESET
HI-Z GROUND DETECTORS ARE SELF-RESETTING

FIGURE 5. GROUND DETECTION CIRCUIT



DIVISION A

DIVISION B

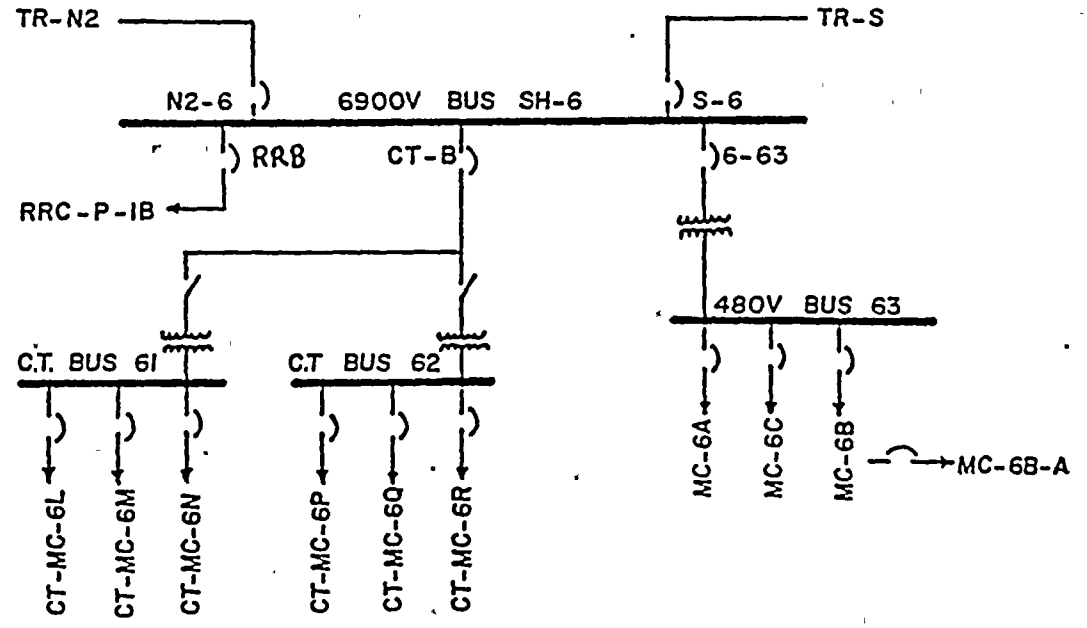


FIGURE 6. 6900V NON-CRITICAL DISTRIBUTION

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MARCH 1984

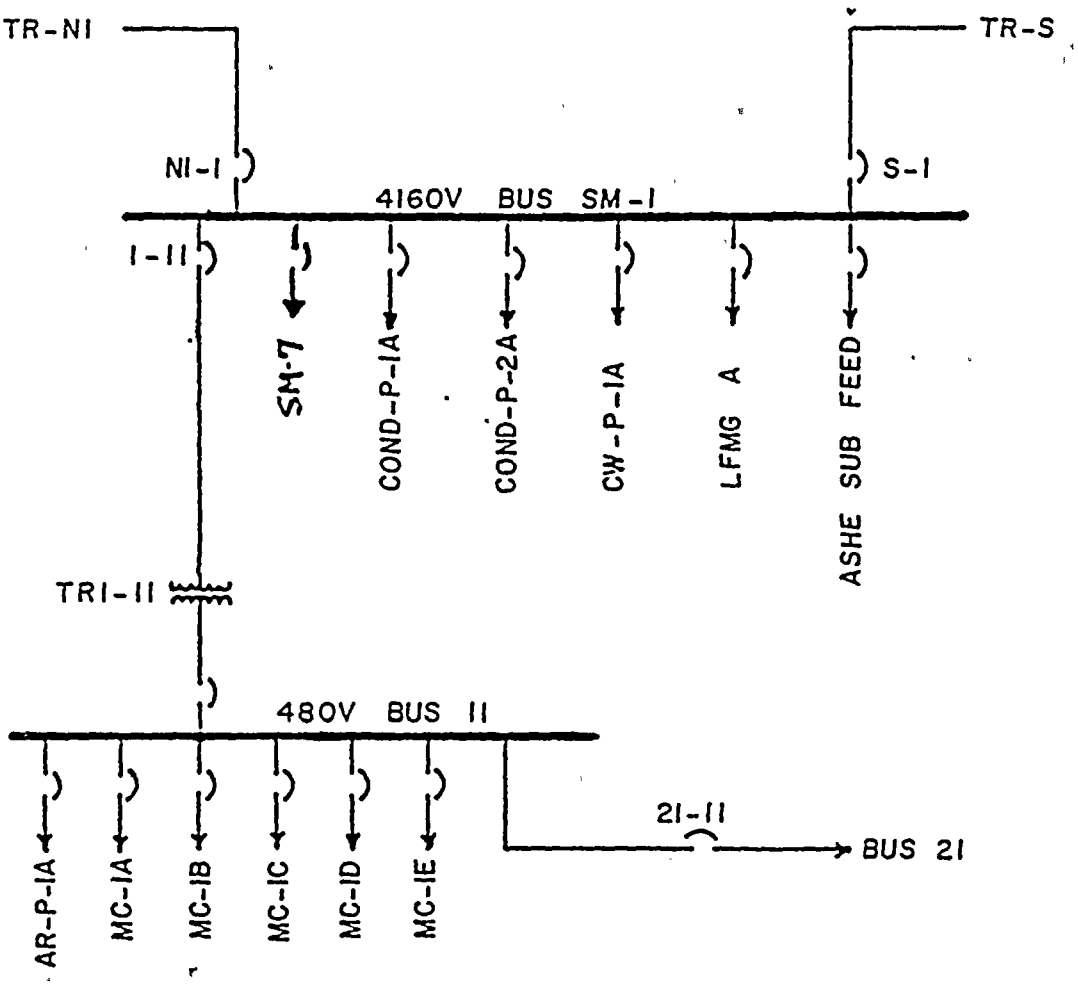

FIGURE 7A. NON-CRITICAL BUS SM-1 4160V & 480V DISTRIBUTION

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MARCH 1984

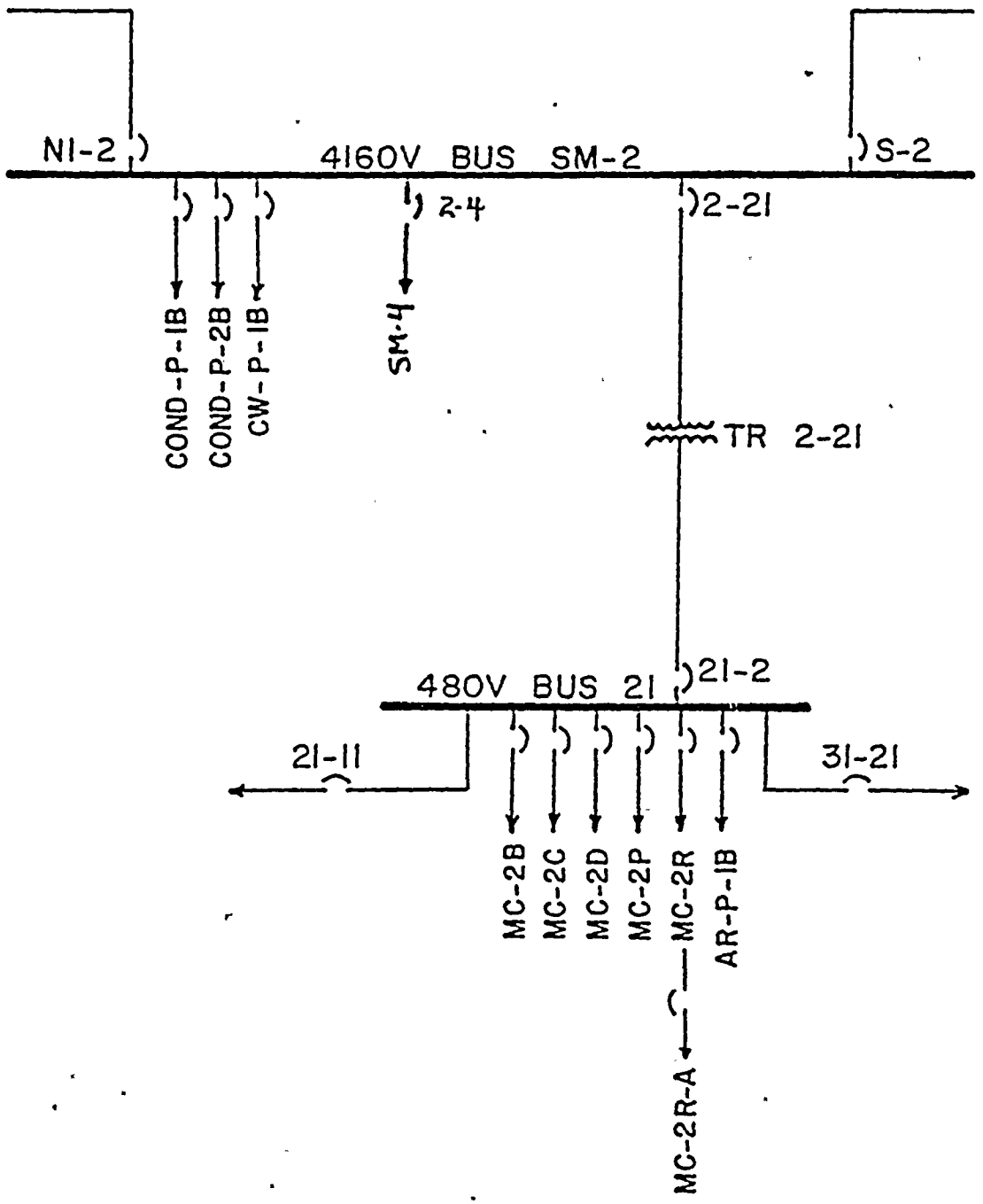

FIGURE 7B. NON-CRITICAL BUS SM-2 4160V & 480V DISTRIBUTION

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MARCH 1984

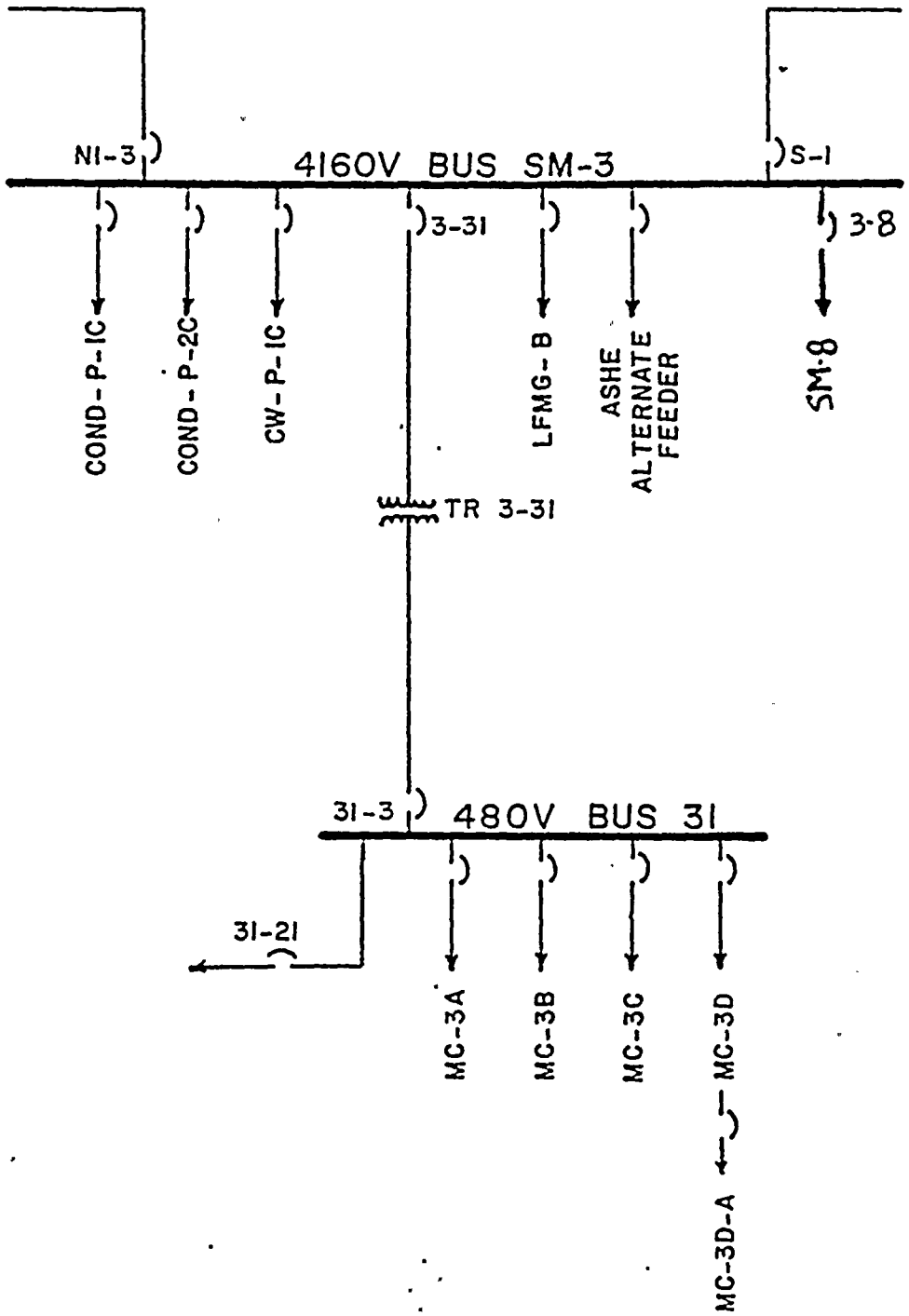

FIGURE 7C. NON-CRITICAL BUS SM-3 4160V & 480V DISTRIBUTION

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MARCH 1984

WASHINGTON NUCLEAR POWER PLANT NO. 2
EXPERIENCE-BASED INSPECTION PLAN

Reactor Protection System (RPS)

TABLE RPS-1 GENERALIZED INSPECTION PLAN

Discussion

PRAs for other BWRs do not provide a detailed system model of the RPS, but rather utilize historic failure data to establish a system failure probability. For completeness, a non PRA-based inspection plan for the WNP-2 RPS has been developed from the following documents:

- WNP-2 FSAR, Section 7
- WNP-2 Systems Training Manual, Volume 2, Section 7
- Recent I&E Information Notices & Bulletins (1985 and 1986 to date)
- NUREG-0460, Anticipated Transients Without Scrams (ATWS) for Light Water Reactors
- GE Standard Technical Specifications
- I&E Manual and Inspection Procedures
- Selected Regulatory Guides & Standards

System Description

The WNP-2 RPS includes the standard BWR-RPS arrangement. The RPS receives power from two MG sets, one for each of the two Trip Systems, A&B. Each MG set is electrically isolated from its RPS bus by two Electrical Protection Assemblies (EPA) arranged in series. These EPAs provide additional protection by monitoring and tripping their respective EPA breaker on overvoltage, undervoltage, or underfrequency. Each trip system has two trip logics, A1&A2 and B1&B2. They are arranged in a one out of two taken twice logic. There are 12 separate signals that can generate a scram. When the scram system actuates, power is cut from the scram pilot valve solenoids, bleeding air from the scram header and opening the scram inlet and outlet valves. This allows water pressure to insert the control rods. Outlet water is sent to the scram discharge volume and scram instrument volume.

Inspection Areas

1. Review and witness RPS function surveillance tests for RPS.

   - Include witness of Partial Manual Scram Test, single rod scram, tests of individual RPS Channels, and RPS EPA Circuit Breakers.

   - References include: R.G. 1.22, "Periodic Testing of Protection System Actuation Function," for RPS; R.G. 1.118, "Periodic Testing of Electric Power and Protection Systems," which endorses IEEE Std 338-1977, "Criteria for Periodic Testing of Nuclear Power Generating Station Safety Systems," for RRCS only.

TABLE RPS-1 (Cont'd)

- Detailed guidance for review of LPRM and APRM calibration is contained in IE Inspection Procedures 61703 and 61704.

2. Tour and inspect control rod drive hydraulic control unit (HCU) area.

3. Review calibration records for system inputs versus-WNP-2 Technical Specifications. Particular attention should be paid to the Reactor Vessel level sensors.

4. Ensure no abnormal RPS alarms in control room.

5. Check RPS and RRCS panels for jumpers. Ensure any existing jumpers are warranted and proper.

6. The Control Structure Chilled Water System and associated cooler units are necessary to assure RPS operates in compliance with design requirements. Ensure it is available and in good condition.

7. Verify that selected Technical Specifications are met:

Control Rods	Section 3/4 1.3
RPS Instrumentation	Section 3/4 3.1
RPS Setpoints	Section 2.2

8. Inspect instrument sensing racks for correct valve configuration, labelling, and separation.

9. Review past work testing of RPS maintenance tasks.

10. Review qualifications and training for technicians performing testing and/or maintenance on the system.

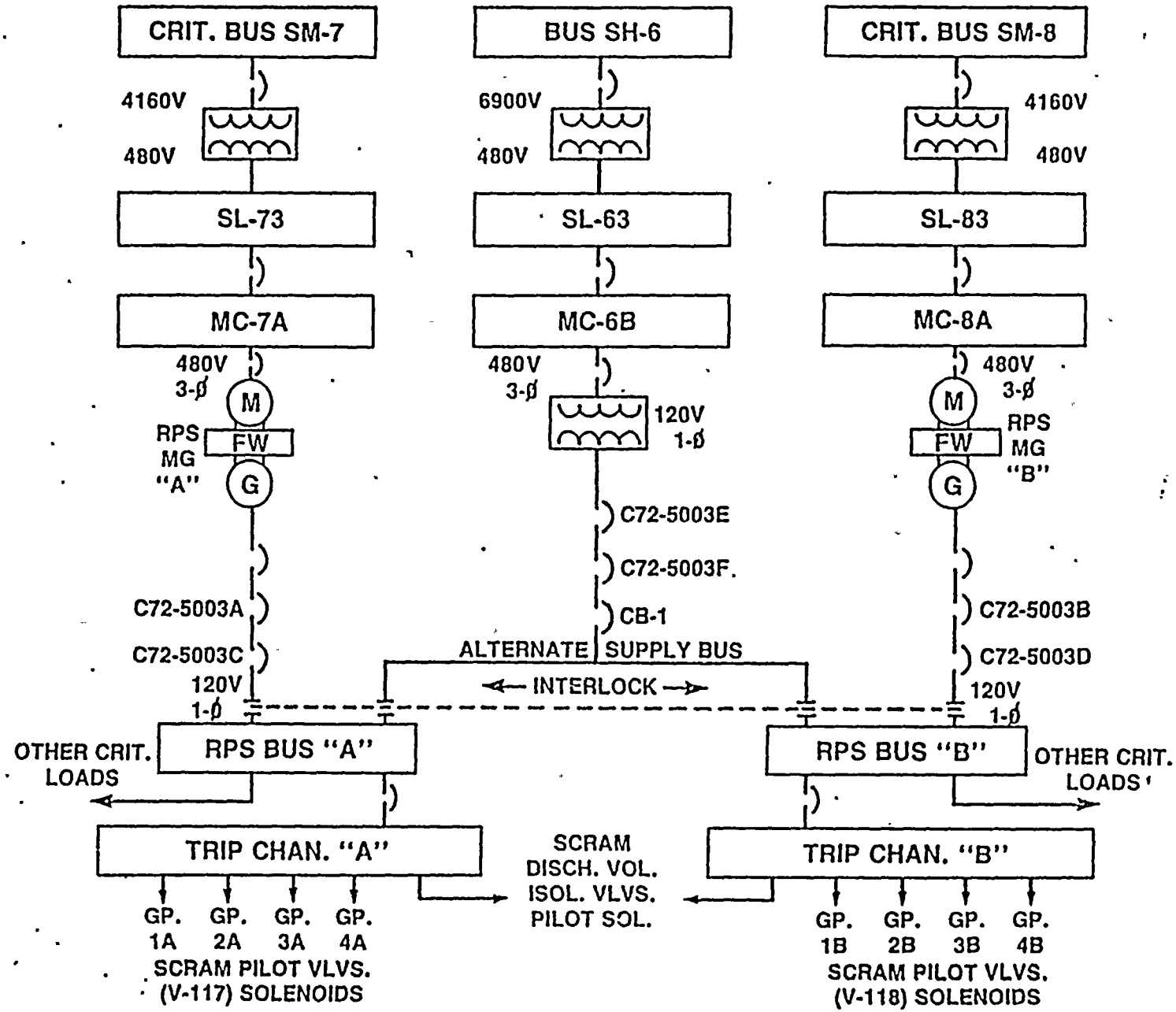


FIGURE 1. RPS POWER DISTRIBUTION

820941.1LT
OCT 1986
RPS

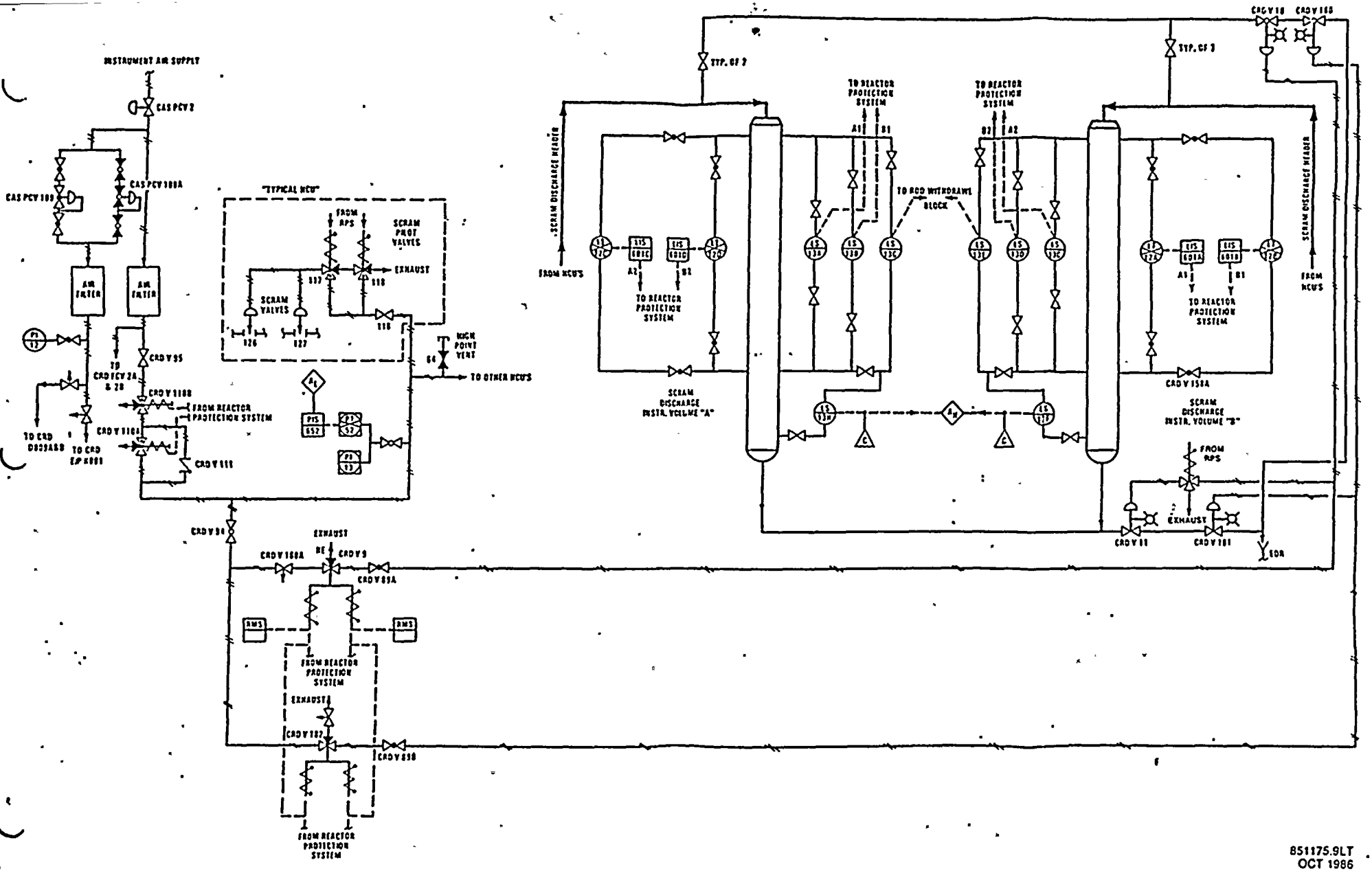


FIGURE 3A. RPS INTERFACE WITH THE CRD SYSTEM

851175.9LT
OCT 1986
RPS

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Service Water Systems (SWS)

TABLE SW-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic testing and/or preventive or unscheduled maintenance activities and procedures and/or normal and emergency operating procedures, training, and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
TS - Technical specifications.

Mission Success Criteria

LATER

Failure Conditions

1. Failure of pumps SW-P-1A, P-1B, and HPCS P-2 to start and run on demand due to:

   a) maintenance outage or pump failure. (PT,MT).
   b) logic circuitry failure. (PC,PT)
   c) plugging of pump suction in sump. (PT)
   d) failure to open pump discharge valves V-2A, V-2B, V-29 or PCV 38 A,B. (PT,MT)

TABLE SW-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

2. Failure of heat exchanger valves to operate on demand:

   a) V-68 A,B RHR heat exchanger. (PT,MT)
   b) V-4 A,B diesel generator cooling. (PT,MT)
   c) V-24 A,B,C RHR pumps 2 A,B,C and room coolers. (PT,MT)
   d) V-44 LPCS pump and room coolers. (PT,MT)

3. Loss of water supply in panel A(B) due to:

   a) failure to equalize level from panel B(A). (OP)
   b) failure to manually provide makeup. (OP)
   c) failure to manually maintain temperature above freezing. (OP)

4. Failure to restore system after test or maintenance. (PT,MT,OP)

   RHR P-2, A,B,C V-22 A,B,C, V-23 A,B,C, V-17 A,B,C
   RHR heat exchanger 1A,B, V-14 A,B
   LPCS P-1, V-37, V-48, V-49
   Syphon vent valves V-168 A,B, V-169 A,B
   Diesel generators V-3 A,B, V-10 A,B, V-40 A,B
   V-5 A,B, V-11 A,B, V-214/215/216/217
   Spray pond return V-12 A,B, V-170 A,B

5. Piping system rupture due to loss of heat tracing. (OP)

Notes:

1. For modified check-off sheets the following criteria was used:

   a) vents and drains deleted
   b) certain room coolers were deleted along with associated instrumentation because they were not a dominant failure mode, sufficient time would be available to identify and correct situation, or they were not essential to system operation.

2. Certain valves may show on two different system lists, i.e., RHR heat exchanger SW inlet/outlet valves could also show in both SW and RHR lists.

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Service Water Systems (SWS)

TABLE SW-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS*	FAILURE MODES
56700	Calibration	SW pumps, valves Logic circuitry	1,2,4
61725	Surveillance Testing & Calibration Program		
61726	Monthly Surveillance Observation		
62702	Maintenance	SW pumps, valves, screens	1,2,4
62703	Monthly Maintenance Observation		
71707	Operational Safety Verification	SW pumps, valves screens Logic circuitry	1,2,4
71710	ESF System Walkdown		
41700	Training	SW pumps, valves spray pond siphon	3,4,5
41701	Requalification Training		

*Refers only to components identified in Tables SW-1 and SW-3.

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Standby Service Water System (SSWS)

TABLE SW-3 MODIFIED SYSTEM WALKDOWN

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-703	A-441	PI-3 and PS-40B Root Valve	Open		
SW-V-29	A-441	HPCS-P-2 Discharge Valve (MO)	Closed		
SW-V-707	A-441	PT-40, PI-40, PS-40A Root	Open		
SW-V-702A	A-441	PX-1A Root	Open		
SW-V-701A	A-441	PS-1API-1AG Root	Open		
SW-V-71A	A-441	SW-P-1A and 1B Pond Crossover	Closed		
SW-V-71B	A-441	SW-P-1A and 1B Pond Crossover	Closed		
SW-V-2A	A-441	SW-P-1A Discharge Valve (MO)	Closed		
SW-V-706A	A-441	PT-32A PI-32A G Root	Open		
SW-V-65A@	A-441	PRA-CC-1A Inlet Isolation	Open		
SW-V-791A	A-441	FIS-42A Root	Open		
SW-V-791B	A-441	FIS-42A Root	Open		
SW-V-66A@	A-441	PRA-CC-1A Outlet Isolation	Throt.†		
SW-V-705A	A-441	PX-42A Root	Closed		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.1

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-12A	A-431	A Loop to B Pond (MO)	Locked Open		
TMU-LVC-1A	A-431	A Pond Makeup	Closed		
TMU-V-10A	A-431	TMU-LCV-1A Isolation	Closed		
SW-V-69A	A-431	A Loop Discharge to Cooling Towers (MO)	Locked Closed		
SW-V-70A	A-431	A Loop Discharge to Cooling Towers (MO)	Locked Closed		
SW-V-820A	A-441	FT-8A Root Valve	Open		
SW-V-821A	A-441	FT-8A Root Valve	Open		
SW-PCV-38A	A-431	A Loop Pressure Controller	Closed		
SW-V-165B	Outside	A Spray Header Bypass	Closed		Open in Cold Weather
SW-V-170B	Outside	A Spray Header Isolation	Open		Open in Cold Weather
SW-V-171B	Outside	A Spray Header Vent	Open		
SW-V-168A	Outside	A Pond Siphon Vent	Closed		Check if pond level is below value
SW-V-169A	Outside	A Pond Siphon Vent	Closed		Check if pond level is below value
SW-V-165A	Outside	B Spray Header Bypass	Closed		Open in Cold Weather
SW-V-170A	Outside	B Spray Header Isolation	Open		Closed in Cold Weather

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-171A	Outside	B Spray Header Vent	Open		
SW-V-168B	Outside	B Pond Siphon Vent	Closed		Check if pond level is below value
SW-V-169B	Outside	B Pond Siphon Vent	Closed		Check if pond level is below value
SW-V-72A	B-441	SW-P-1B to A Pond Crossover	Closed		
SW-V-72B	B-441	SW-P-1B to A Pond Crossover	Closed		
SW-V-2B	B-441	SW-P-1B Discharge(MO)	Closed		
SW-V-65B@	B-441	PRA-CC-1B Inlet Isolation	Open		
SW-V-66B@	B-441	PRA-CC-1B Outlet Isolation	Throt.†		
SW-705B	B-441	PX-42B Root	Closed		
SW-V-792A	B-441	FIS-42B Root	Open		
SW-V-792B	B-441	FIS-42B Root	Open		
SW-V-12B	B-431	B Loop to A Spray Pond (MO)	Locked Open		
TMU-V-10B	B-431	B Pond Makeup	Closed		
TMU-V-10B	B-431	TMU-LCV-1B Isolation	Closed		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO._____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-69B	B-431	B Loop to Cooling Towers (MO)	Locked Closed		
SW-V-70B	B-431	B Loop to Cooling Towers (MO)	Locked Closed		
SW-V-820B	B-441	FT-8B Root Valve	Open		
SW-V-821B	B-441	FT-8B Root Valve	Open		
SW-PCV-38B	B-431	B Loop Pressure Control	Closed		
SW-V-105D @	RW-525	WMA-CC-51-A1 Supply	Open		
SW-V-107D @	RW-525	Wma-CC-51-A1 Supply	Open		
SW-V-737G	RW-525	P X 51A Root	Closed		
SW-V-104D @	RW-525	WMA-CC-51-A1 Outlet	Throt. †		
SW-V-106D @	RW-525	WMA-CC-51-A1 Outlet Valve	Throt.†		
SW-V-781A	RW-525	SW-FIS-35 Root	Open		
SW-V-781B	RW-525	SW-FIS-35 Root	Open		
SW-V-822A @	RW-525	Iso, WMA-CC-51A-1 Supply	Open		M775
SW-V-823A @	RW-525	Iso, WMA-CC-51A-1 Outlet	Open		M775
SW-V-225A @	RW-525	WM-CC-51A-1 Bypass	Closed		Closed if chiller is idle.

@ Requires independent verification of valve position by licensee personnel.
† Throttle each valve to obtain 60 gpm per valve for a total flow of 120 ± 6 gpm (see 7.4.7.1.1.1).

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-224A @	RW-525	Iso, Supply to CCH-CR-1A	Closed		M775
SW-V-826A	RW-525	Iso, CCH-CR-1A	Open		
SW-V-227A @	RW-525	Iso, CCH-P-1A Suction	Closed		M775
SW-V-898	RW-525	Vent, CCH-P-1A Suction Hdr	Closed		M775
SW-V-897	RW-525	Vent, CCH-EV-1A Discharge Hdr	Closed		M775
SW-V-896A	RW-525	SW-FX-1A Root	Closed		M775
SW-V-899A	RW-525	SW-VX-1A Root	Closed		M775
SW-V-59A	RW-525	WMA-CC-52-A1 Supply Isolation	Open		
SW-V-60A@	RW-525	WMA-CC-52-A1 Return Isolation	Throt. †		
SW-V-109A @	RW-525	WMA-CC-53-A1 Supply Isolation	Open		
SW-V-110A @	RW-525	WMA-CC-53-A1 Return Line Isolation	Open		
SW-V-63A@	RW-525	WMA-CC-53-A1 Return Line Isolation	Throt.†		
SW-V-109B @	RW-525	WMA-CC-53-B1 Supply Isolation	Open		
SW-V-111B @	RW-525	WMA-CC-53-B1 Supply Isolation	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.1.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-108B @	RW-525	WMA-CC-53-B1 Return Isolation	Open		
SW-V-110B @	RW-525	WMA-CC-53-B1 Return Isolation	Open		
SW-V-63B@	RW-525	WNA-CC-53-B1 Return Isolation	Throt. †		
SW-V-59B@	RW-525	WMA-CC-52-B1 Supply Isolation	Open		
SW-V-60B@	RW-525	WMA-CC-52-B1 Return Isolation	Throt. †		
SW-V-105C @	RW-525	WMA-CC-51-B1 Supply Isolation	Open		
SW-V-107C @	RW-525	WMA-CC-51-B1 Supply Isolation	Open		
SW-V-104C @	RW-525	WMA-CC-51-B1 Return Isolation	Throt.†		
SW-V-106C @	RW-525	WMA-CC-51-B1 Return Isolation	Throt. †		
SW-V-822B @	RW-525	Iso, WMA-CC-51B-1 Supply	Closed		M775
SW-V-823B @	RW-525	Iso, WMA-CC-51B-1 Outlet	Closed		M775

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.
† Throttle each valve to obtain 60 gpm per valve for a total flow of 120 ± 6 gpm (see 7.4.7.1.1.2).

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-826B	RW-525	Iso, CH-CR-1B Outlet Header	Open		M775
SW-V-224B @	RW-525	Iso, Supply to CCH-CR-1B	Open		M775
SW-V-227B @	RW-525	Iso, CCH-P-1B Suction	Open		M775
SW-V-830B	RW-525	SW-FX-2B Low Side Root	Closed		M775
SW-V-831B	RW-525	SW-FX-2B High Side Root	Closed		M775
SW-V-832B	RW-525	SW-PI-42B Root	Open		M775
SW-V-852B	RW-525	SW-PI-41B Root	Open		M775
SW-V-896B	RW-525	SW-FX-1B High Side Iso	Closed		M775
SW-V-899B	RW-525	SW-FX-1B Low Side Iso	Closed		M775
SW-V-737F	RW-525	SW-PX-51B Root	Closed		M775
SW-V-3B@	DG RM1B	Supply Isolation	Open		
SW-V-40B@	DG RM1B	DCW-HX-1B1 & 1B2 Supply Isolation	Open		
SW-V-736B	DG RM1B	PX-15A Root	Closed		
SW-V-220B @	DG RM1B	DCW-TK-1B1, 1B2 Iso	Open		
SW-V-221B 1@	DG RM1B	DCW-TK-1B1 Iso	Closed		
SW-V-221B 2@	DG RM1B	DCW-TK-1B2 Iso	Closed		

@ Requires independent verification of valve position by licensee personnel.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-4B	DG RM1B	DG 1B Return Iso (MO)	Open		
SW-V-5B@	DB RM1B	DCW-HX-1B1 and 1B2 Return Isolation	Throt. †		
SW-V-714B	DG RM1B	PX-15B Root	Closed		
SW-V-748	DG RM1B	FIS-15 Root	Open		
SW-V-749	DG RM1B	FIS-15 Root	Open		
SW-V-217	DG RM1B	FIS-15 Root	Open		
SW-V-217	DG RM1B	DCW-HX-1B2 Inlet (AO)	Closed		
SW-V-712B	DG RM1B	PX-14A Root Isolation	Closed		
SW-V-769A	DG RM1B	FIS-14A Root Isolation	Open		
SW-V-769B	DG RM1B	FIS-14A Root Isolation	Open		
SW-V-11B@	DG RM1B	DMA-CC-21 Upper Outlet Isolation	Throt. †		
SW-V-104B@	DG RM1B	DMA-CC-21 Lower Outlet Isolation	Open		
SW-V-106B@	DG RM1B	DMA-CC-21 Lower Outlet Isolation	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-105B @	DG RM1B	DMA-CC-21 Inlet Isolation	Open		
SW-V-107B @	DG RM1B	DMA-CC-21 Inlet Isolation	Open		
SW-V-737C	DG RM1B	PX-47A Root	Closed		
SW-V-713B	DG RM1B	SW-PX-14B	Closed		
SW-V-10B@	DG RM1B	PMA-CC-22 Return	Throt. †		
SW-V-770A	DG RM1B	FIS-14B Root	Open		
SW-V-770B	DG RM1B	FIS-14B Root	Open		
SW-V-8B@	DG RM1B	DMA-CC-22 Supply Iso	Open		
SW-V-715	DG Cable RM	PX-38 Root	Closed		
SW-V-93@	DG Cable RM	DMA-CC-51 Return Isolation	Throt. †		
SW-V-787A	DG Cable RM	FIS-38 Root	Open		
SW-V-787B	DG Cable RM	FIS-38 Root	Open		
SW-V-90	DG Cable RM	DMA-CC-51 Supply Isolation (MO)	Closed		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-4C	HPCS DG RM	Return Isolation (MO)	Open		
SW-V-744	HPCS DG RM	FIS-9 Root Isolation	Open		
SW-V-745	HPCS DG RM	FIS-9 Root Isolation	Open		
SW-V-709	HPCS DG RM	PX-9B Root	Closed		
SW-V-82@	HPCS DG RM	DCW-HX-1C Return Isolation	Throt. †		
SW-V-708	HPCS DG RM	PX-9A Root	Closed		
SW-V-89@	HPCS DG RM	DCW-HX-1C Supply Isolation to HPCS DG Cooler	Open		
SW-V-222@	HPCS DG RM	DG-ENG-1C Supply	Closed		
SW-V-80@	HPCS DG RM	DCW-HX-1C Supply Isolation to HPCS DG Cooler	Locked Open		
SW-V-85@	HPCS DG RM	DMA-CC-32 Supply Iso	Open		
SW-V-766A	HPCS DG RM	FIS-8B Root Isolation	Open		
SW-V-766B	HPCS DG RM	FIS-8B Root Isolation	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-87@	HPCS DG RM	DMA-CC-32 Return Isolation	Throt. †		
SW-V-711	HPCS DG RM	PX-8B Root	Closed		
SW-V-737A	HPCS DG RM	PX-45A Isolation	Closed		
SW-V-101@	HPCS DG RM	DMA-CC-31 Supply Isolation	Open		
SW-V-103@	HPCS DG RM	DMA-CC-31 Supply Isolation	Open		
SW-V-100@	HPCS DG RM	DMA-CC-31 Return Isolation	Open		
SW-V-102@	HPCS DG RM	DMA-CC-31 Return Isolation	Open		
SW-V-88@	HPCS DG RM	DMA-CC-31 Return Isolation	Throt. †		
SW-V-710	HPCS DG RM	PX-8A Root	Closed		
SW-V-765A	HPCS DG RM	FIS-8A Root	Open		
SW-V-765B	HPCS DG RM	FIS-8A Root	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TtBLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-4A	DG RM1A	Return Isolation (MO)	Open		
SW-V-746	DG RM1A	FIS-12 Root	Open		
SW-V-747	DG RM1A	FIS-12 Root	Open		
SW-V-714	DG RM1A	PX-12B Isolation	Closed		
SW-V-5A@	DG RM1A	DCW Hx's Return Isolation	Throt. †		
SW-V-214	DG RM1A	DCW-HX-1A1 Supply Isolation (AO)	Closed		
SW-V-220A @	DG RM1A	DCW-TK-1A1, 1A2 Iso	Open		
SW-V-221 A1@	DG RM1A	DCW-TK-1A1 Iso	Closed		
SW-V-221 A2@	DG RM1A	DCW-TK-1A2 Iso	Closed		
SW-V-736A	DG RM1A	PX-12A Root	Closed		
SW-V-40A@	DG RM1A	DCW Hx's Supply Isolation	Open		
SW-V-3A@	DG RM1A	DG-1A Supply	Open		
SW-V-215	DG RM1A	DCW-HX-1A2 Supply Isolation (AO)	Closed		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-712A	DG RM1A	PX-11A Root	Closed		
SW-V-767A	DG RM1A	FIS-11A Root	Open		
SW-V-767B	DG RM1A	FIS-11A Root	Open		
SW-V-11A@	DG RM1A	DMA-CC-11 Return	Throt. †		
SW-V-105A @	DG RM1A	DMA-CC-11 Inlet Isol	Open		
SW-V-107A	DG RM1A	DMA-CC-11 Inlet Isol	Open		
SW-V-106A @	DG RM1A	DMA-CC-11 Lower Outlet Isol	Open		
SW-V-737B	DG RM1A	DMA-CC-11 Inlet PX Isol	Closed		
SW-V-104A @	DG RM1A	DMA-CC-11 Upper Outlet Isolation	Open		
SW-V-713A	DG RM1A	PX 11B Root	Closed		
SW-V-10A@	DG RM1A	DMA-CC-12 Return Isolation	Throt. †		
SW-V-768A	DG RM1A	FIS-11B Root Isol	Open		
SW-V-768B	DG RM1A	FIS-11B Root Isol	Open		
SW-V-8A@	DG RM1A	DMA-CC-12 Supply Isol	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-113@	RB-572	RRA-CC-14 Outlet Isolation	Throt. †		
SW-V-730	RB-572	PX-61 Root	Closed		
SW-V-796A	RB-572	FIS-61 Root	Open		
SW-V-796B	RB-572	FIS-61 Root	Open		
SW-V-112@	RB-572	RRA-CC-14 Supply Iso	Open		
SW-V-128A @	RB-572	CAC-1A Outlet Iso	Throt. †		
SW-V-126A @	RB-572	CAC 1A Aftercooler Inlet Isolation	Open		
SW-V-127A @	RB-572	CAC 1A Scrubber Inlet Isolation	Open		
SW-V-115@	RB-572	RRA-CC-13 Return Iso	Throt. †		
SW-V-114@	RB-572	RRA-CC-13 Supply Iso	Open		
SW-V-127B @	RB-572	CAC-1B Scrubber Supply Isolation	Open		
SW-V-126B @	RB-572	CAC-1B Aftercooler Isolation	Open		
SW-V-128B @	RB-572	CAC-1B Return Iso	Throt. †		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-798A	RB-572	FIS-69B Root Isol	Open		
SW-V-798B	RB-572	FIS-69B Root Isol	Open		
SW-V-762B	RB-572	SW-SR-43 Return Isol	Open		
SW-V-763B	RB-572	SW-SR-43 Supply Isol	Open		
SW-V-762A	RB-572	SW-SR-42 Supply Isol	Open		
SW-V-763A	RB-572	SW-SR-42 Return Isol	Open		
SW-V-75A	RB-522	Emergency Makeup to Fuel Pool (MO)	Closed		
SW-V-75B	RB-522	Emergency Makeup to Fuel Pool (MO)	Closed		
SW-V-187B	RB-548	FPC-HX-1B Inlet Iso (MO)	Closed		
SW-V-188B	RB-548	FPC-HX-1B Outlet Iso (MO)	Closed		
SW-V-187A	RB-548	FPC-HX-1A Inlet Iso (MO)	Closed		
SW-V-188A	RB-548	FPC-HX-1A Outlet Iso (MO)	Closed		
SW-V-190@	RB-548	RRA-CC-19 Outlet Iso	Open		
SW-V-189@	RB-548	RR-CC-19 Inlet Iso	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-184B @	RB-548	RRA-CC-19 Outlet	Throt.. †		
SW-V-185@	RB-548	RRA-CC-19 Inlet Iso	Open		
SW-V-191@	RB-548	RRA-CC-20 Inlet Iso	Open		
SW-V-192@	RB-548	RRA-CC-20 Outlet Iso	Open		
SW-V-184@	RB-548	RRA-CC-20 Outlet Iso	Throt. †		
SW-V-193@	RB-548	RRA-CC-20 Inlet Iso	Open		
SW-V-133@	RB-548	RRA-CC-15 Return Iso	Throt. †		
SW-V-132@	RB-548	RRA-CC-15 Supply Iso	Open		
SW-V-137	RB-548	IR-13 & IR-20 Supply Isol. Deactivated	Closed		
SW-V-138	RB-548	IR-13 & IR-20 Return Isol. Deactivated	Closed		
SW-V-135@	RB-548	RRA-CC-17 Return Iso	Throt. †		
SW-V-134@	RB-548	RRA-CC-17 Supply Iso	Open		
SW-V-140	RB-548	SR-14 & 21 Return Isol. Deactivated	Closed		
SW-V-139	RB-548	SR 14 & 21 Supply Isol. Deactivated	Closed		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-175B	RB-548	Demineralized Water Isolation	Closed		
RHR-V-14B @	RB-560	RHR-HX-1B Serv Water Inlet	Throt. †		
RHR-V-68B	RB-551	RHR-HX-1B Serv Water Outlet (MO)	Open		
SW-V-733A	RB-548	PX-5B Root	Closed		
SW-V-732B	RB-548	FT 7B Root	Open		
SW-V-731B	RB-548	FT 7B Root	Open		
SW-V-735A	RB-548	PT-38B Root	Open		
SW-V-734A	RB-548	PT-6B Root	Open		
SW-V-756B	RB-548	SP-63B Isolation	Open		
SW-V-731A	RB-548	FT 7A Root	Open		
SW-V-732A	RB-548	FT 7A Root	Open		
SW-V-733B	RB-548	PX-5A Root	Closed		
SW-V-175A	RB-548	Demineralized Water Isolation	Closed		
RHR-V-14A @	RB-558	RHR-HX-1A Serv Water Inlet	Throt. †		
RHR-V-68A	RB-553	RHR-HX-1A Serv Water Outlet (MO)	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-735B	RB-548	PT-38A Root	Open		
SW-V-734B	RB-548	PT-6A Root	Open		
SW-V-756A	RB-548	SP-63A Isolation	Closed		
SW-V-75BB@	RB-530	Loop B Manual Isol. to FPC	Closed		
SW-V-75AA@	RB-530	Loop A Manual Isol. to FPC	Closed		
SW-V-95@	RB-522	RRA-CC-11 Supply Iso	Open		
SW-V-96@	RB-522	RRA-CC-11 Return Iso	Throt. †		
SW-V-91@	RB-522	RRA-CC-10 Inlet Iso	Open		
SW-V-94@	RB-522	RRA-CC-10 Return Iso	Throt. †		
SW-V-684	R-480	PSR-SR-47 Isol	Open		
SW-V-17C@	RB-446	RRA-CC-1 Return Iso	Throt. †		
SW-V-777A	RB-446	FIS-23C Root Valve	Open		
SW-V-777B	RB-446	FIS-23C Root Valve	Open		
SW-V-719C	RB-446	PX-23C Isolation	Closed		
SW-V-16C@	RB-446	RRA-CC-1 Supply Iso	Open		
SW-V-34@	RB-446	RRA-CC-6 Return Iso	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-27@	RB-446	RRA-CC-6 Return Iso (MO)	Throt.. †		
SW-V-780A	RB-446	FIS-29 Root Valve	Open		
SW-V-780B	RB-446	FIS-29 Root Valve	Open		
SW-V-718	RB-446	PX-29 Isolation	Closed		
SW-V-26@	RB-446	RRA-CC-6 Supply Iso	Open		
SW-V-54@	RB-446	RRA-CC-4 Cooler Outlet Isolation	Open		
SW-V-47@	RB-446	RRA-CC-4 Cooler Outlet Isol. (MO)	Throt. †		
SW-V-779A	RB-446	FIS-27 Root Valve	Open		
SW-V-779B	RB-446	FIS-27 Root Valve	Open		
SW-V-716	RB-446	PX-27 Root Valve	Closed		
SW-V-46@	RB-446	RRA-CC-4 Inlet Iso	Open		
SW-V-778A	RB-446	FIS-25 Root Valve	Open		
SW-V-778B	RB-446	FIS-25 Root Valve	Open		
SW-V-717	RB-446	PX-25 Root Valve	Closed		
SW-V-36	RB-446	RRA-CC-5 Inlet Iso	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-37@	RB-446	RRA-CC-5 Return Iso	Throt. †		
SW-V-22C@	RB-421	C RHR Pump Motor Cooler Supply Isol.	Open		
SW-V-721C	RB-421	PX-17C Root Valve	Closed		
SW-V-773A	RB-421	FIS-17C2 Root Valve	Open		
SW-V-773B	RB-421	FIS-17C2 Root Valve	Open		
SW-V-17A@	RB-446	RRA-CC-2 Return Isol	Throt. †		
SW-V-775A	RB-446	FIS-23A Root Valve	Open		
SW-V-775B	RB-446	FIS-23A Root Valve	Open		
SW-V-719A	RB-446	PX-23A Root Valve	Closed		
SW-V-16A@	RB-446	RRA-CC-2 Supply Isol	Open		
SW-V-17B	RB-446	RRA-CC-3 Return Isol	Throt. †		
SW-V-776A	RB-446	FIS-23B Root Valve	Open		
SW-V-776B	RB-446	FIS-23B Root Valve	Open		
SW-V-719B @	RB-446	PX-23B Root Valve	Closed		
SW-V-16B	RB-446	RRA-CC-3 Supply Isol	Open		
SW-V-24A@	RB-421	A RHR Room Return Iso	Open		
SW-V-721A	RB-421	PX-17A Root Valve	Closed		
SW-V-722	RB-421	PX-39 Root	Closed		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-23A	RB-421	A RHR Pump Motor Return Isolation	Throt. †		
SW-V-771A	RB-421	FIS-17A2 Root Valve	Open		
SW-V-771B	RB-421	FIS-17A2 Root Valve	Open		
SW-V-22A@	RB-421	A RHR Pump Motor Supply Isolation	Open	✓	
SW-V-24B@	RB-421	B RHR Room Return Iso	Open		
SW-V-721B	RB-421	PX-17B Root	Closed		
SW-V-23B@	RB-421	B RHR Pump Motor Cooler Return Isol	Throt. †		
SW-V-772A	RB-421	FIS-17B2 Root Valve	Open		
SW-V-772B	RB-421	FIS-17B2 Root Valve	Open		
SW-V-22B@	RB-421	B RHR Pump Motor Supply Isolation	Open		
SW-V-48@	RB-421	LPCS Pump Motor Cooler Supply Isol	Open		
SW-V-49@	RB-421	LPCS Pump Motor Cooler Return Isol	Throt. †		
SW-V-774A	RB-421	FIS-19 Root Valve	Open		
SW-V-774B	RB-421	FIS-19 Root Valve	Open		

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SW-V-720	RB-421	PX-19 Root Valve	Closed		
SW-V-44@	RB-421	LPCS Pump Room Return Isolation	Open		
SW-V-24C@	RB-421	C RHR Room Return Isolation	Open		
SW-V-23C@	RB-421	C RHR Pump Motor Cooler Return Isol	Throt. †		
SW-V-97@	RX Bldg 522	RRA-CC-12 Inlet Iso	Open		
SW-V-848	R-471	Iso from PSR-SR-47	Open		
SW-V-155R@	R-522	PSR-SR-47 Return Iso RRA-CC-12 Outlet	Open		
SW-V-98@	R-485	RRA-CC-12 Return	Throt. †		
SW-V-847	R-471	Supply to PSR-SR-47	Open		
SW-V-688	R-471	Supply to PSR-SR-47	Open		
SW-V-840	R-471	PSR Cooling Supply from Loop A (SO)	Closed		Controlled from RX 487' PSR Rm.
SW-V-842	R-471	PSR Cooling Supply from Loop B (SO)	Closed		Controlled from RX 487' PSR Rm.
SW-V-844	R-471	PSR Cooling Supply from Loop A (SO)	Closed		Controlled from RX 487' PSR Rm.
SW-V-846	R-471	PSR Cooling Supply from Loop B (SO)	Closed		Controlled from RX 487' PSR Rm.

@ Requires independent verification of valve position by licensee personnel.
† Sealed after flow set per PPM 7.4.7.1.1.2.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SM-7	W-467	SW-P-1A	Racked In		
SM-8	W-467	SW-P-1B	Racked In		
MC-7A	W-467	SW-V-2A	Closed		
MC-7A	W-467	SW-V-12A	Open +		
MC-7A	W-467	SW-V-69A	Open +		
MC-7A	W-467	SW-V-70B	Open +		
MC-8A	W-467	SW-V-2B	Closed		
MC-8A	W-467	SW-V-12B	Open +		
MC-8A	W-467	SW-V-69B	Open +		
MC-8A	W-467	SW-V-70A	Open +		
MC-8A-A CKT5E	D-441	SW-V-90	Closed		
MC-4A	D-441	POA-FN-2A	Closed		
MC-4A	D-441	SW-V-4C	Closed		
MC-4A	D-441	SW-V-29	Closed		
MC-4A	D-441	SW-V-54	Closed		

+ These breakers are to be locked open and tagged.

TABLE SW-3 (Cont'd)

DRAWING NO. _____

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-4A	D-441	HPCS-P-2	Closed		
MC-7A-A	D-441	PRA-FN-1A	Closed		
MC-7A-A	D-441	PRA-EUH-1A	Closed		
MC-7A-A	D-441	PRA-EUH-2A	Closed		
MC-7A-A	D-441	PRA-EUH-3A	Closed		
PP-7A-B#4	A-441	PRA-EUH-4A	Closed		
MC-7A-A	D-441	SW-V-4A	Closed		
MC-7A-A	D-441	SW-V-4B	Closed		
MC-8A-A	D-441	PRA-FN-1B	Closed		
MC-8A-A	D-441	POA-FN-2B	Closed		
MC-8A-A	D-441	PRA-EUH-1B	Closed		
MC-8A-A	D-441	PRA-EUH-2B	Closed		
MC-8A-A	D-441	PRA-EUH-3B	Closed		
PP-8A-B#4	B-441	PRA-EUH-4B	Closed		
MC-7B	R-522	SW-V-24A	Closed		
MC-7B	R-522	SW-V-44	Closed		

TABLE SW-3 (Cont'd)

DRAWING NO. _____

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
PP-8A-E CKT 10E	R-471	SW-V-34 Normal Supply	Closed		
PP-8A-F CKT 10	RW-467	SW-V-34 Emergency Supply	Closed		
MC-8B-A	R-522	SW-V-24B	Closed		
MC-8B-A	R-522	SW-V-24C	Closed		
MC-7B-B	R-572	SW-V-68A	Closed		
MC-8B-B	R-572	SW-V-68B	Closed		
MC-7B-A	R-522	SW-V-75A	Closed		
MC-7B-A	R-572	SW-V-187A	Closed		
MC-7B-B	R-522	SW-V-188A	Closed		
MC-8B-A	R-522	SW-V-75B	Closed		
MC-8B-A	R-522	SW-V-187B	Closed		
MC-8B-B	R-572	SW-V-188B	Closed		
CS-RSIP-1	RW-467	Instrument Cont Pwr XFER SW	Off		
FRTS-3	RW-467	Iso SW for SW-V-4B	Norm		

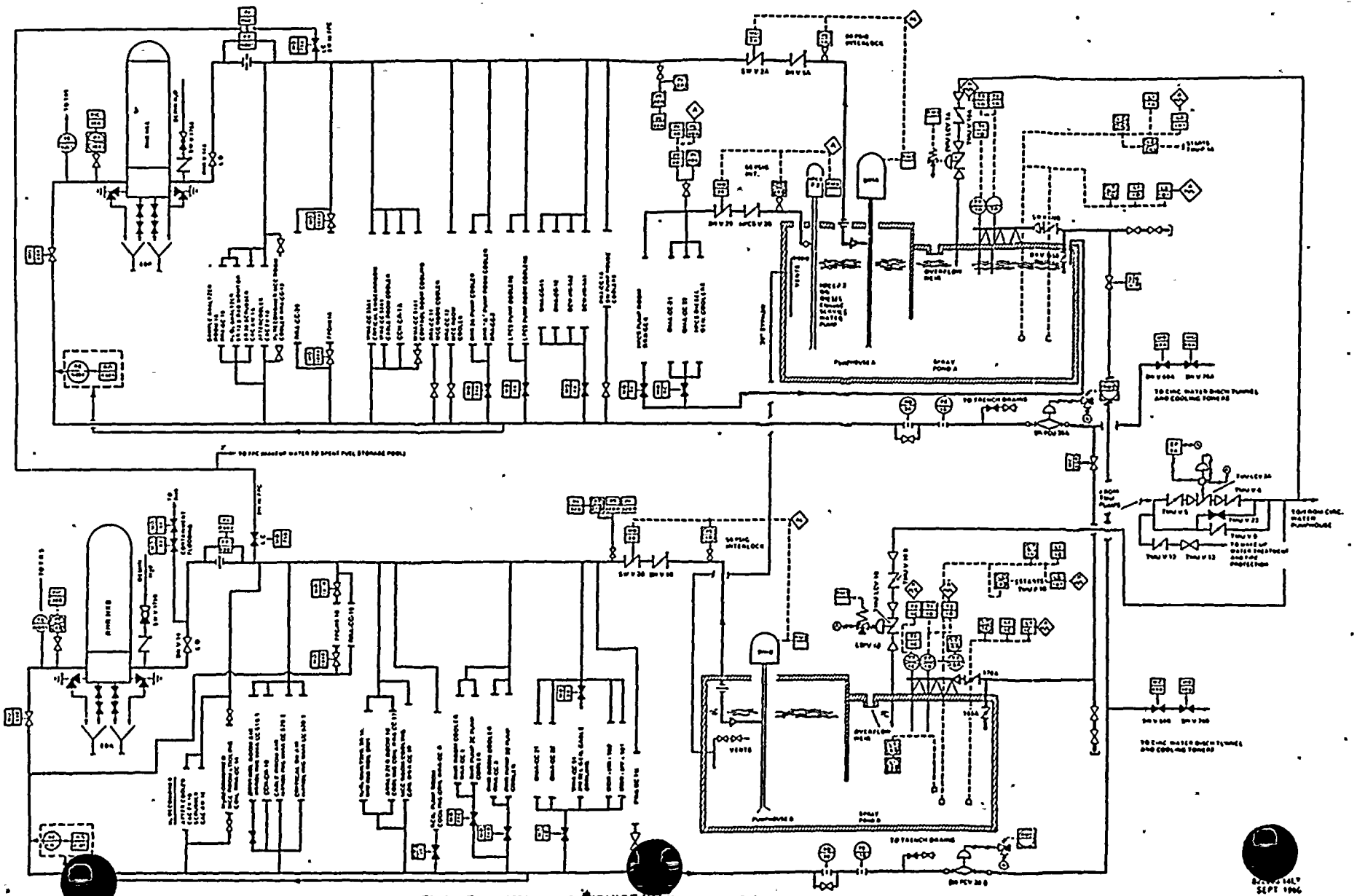


FIGURE 1 STANDBY SERVICE WATER SYSTEM

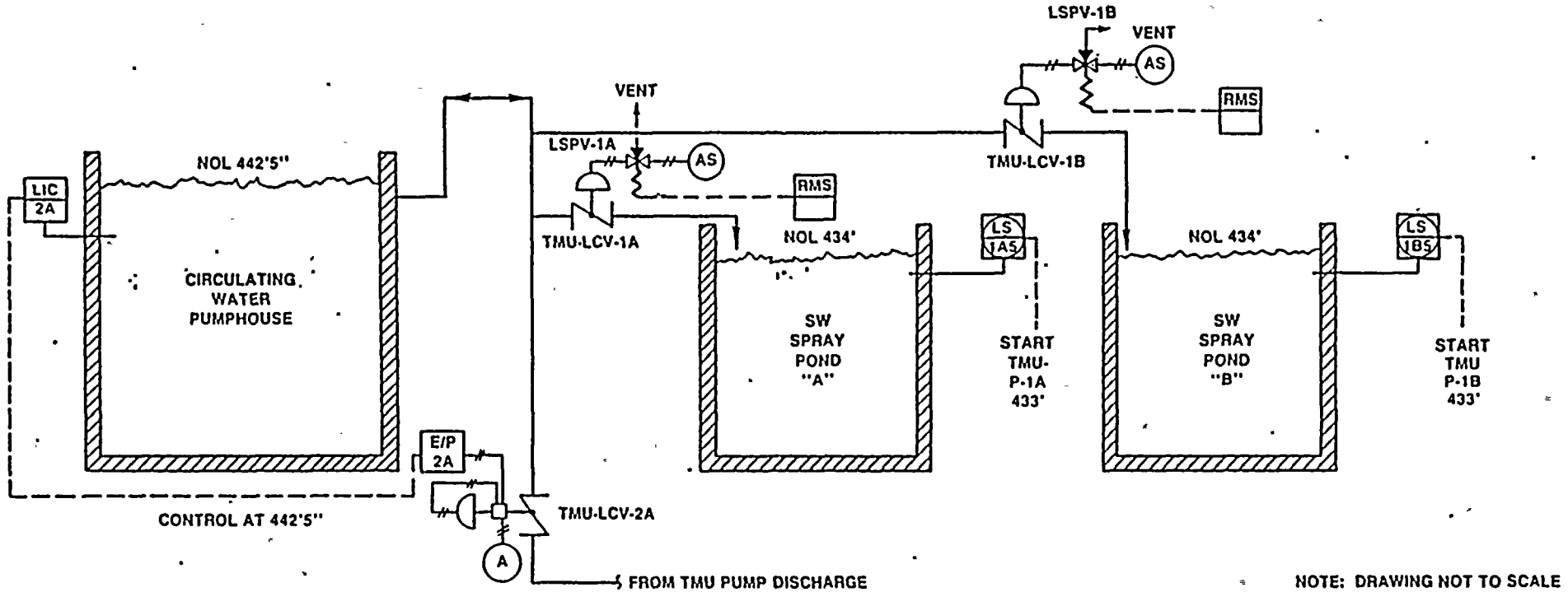


FIGURE 2 CIRCULATING WATER/SERVICE WATER LEVEL CONTROL ARRANGEMENT

822063-13A

SW POND LEVELS

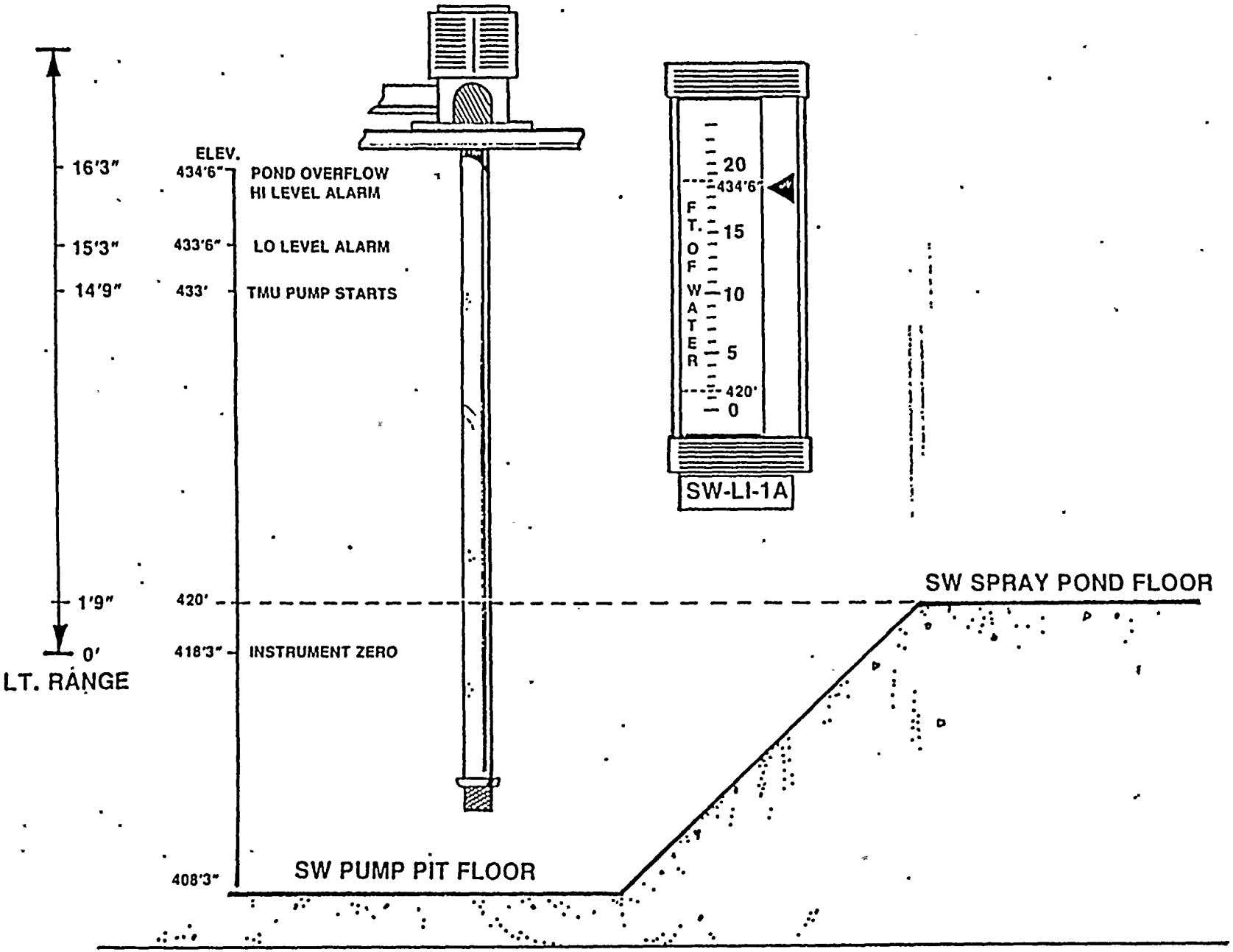


FIGURE 3

822157-10A

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Primary Containment Systems

TABLE PRCT-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration, testing and/or preventive or unscheduled maintenance activities, procedures and training and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.

Mission Success Criteria

The main containment systems considered here are the Primary Containment, Drywell Sprays, the Suppression Pool, the Secondary Containment and the Standby Gas Treatment System (SGTS). The Primary Containment serves to contain fission products post-accident and consists of the drywell and suppression pool walls and the containment isolation system. From a risk standpoint, small leaks are not a major concern, but large leaks, on the order of the tech spec limit (La) or larger can be very significant to risk. Drywell Sprays are important to ensure H_2 mixing, pressure reduction and removal of fission products from the atmosphere. The Suppression Pool serves to limit containment pressure, scrub fission products, and provide a source of water for the ECCS. The Secondary Containment and the SGTS work together to help ensure any leakage from the Primary Containment is either captured or released through an elevated, filtered vent path. The SGTS also has area coolers to limit temperatures in the various ECCS equipment areas. Since there are no detailed fault trees or minimal cutsets in most PRAs for these containment systems, this inspection plan does not have the detail of the front end systems.

Important Aspects of Containment Systems

1. Emergency procedures and training established to vent containment wetwell (Suppression Pool) during containment overpressure scenarios.

CONDITIONS THAT CAN LEAD TO FAILURE

2. Maintaining functionability of SP due to its multiple uses of condensing steam, scrubbing fission products, and providing the ECCS with water.

3. Sequences that bypass containment or result in early containment failure are important to offsite risk. Important areas associated with bypass of containment are containment isolation failure due to valve failures (such as Reactor Building to wetwell vacuum breakers) or gross leakage through containment.

4. One important area associated with early containment overpressure is SP bypass. (The SP bypass leak test addresses this.) Failure modes leading to SP bypass include leakage of the drywell to wetwell vacuum breakers, and rupture or leaks in the downcomer pipes. The drywell to SP differential pressure monitoring instrumentation is important in monitoring the integrity of these boundaries.

5. Suppression Pool Water Unavailable Due to Rupture: Loss of the Suppression Pool water inventory prevents the reactor vessel from being cooled by the ECCS systems. To minimize this occurrence, the results of the containment integrated leak rate tests can be reviewed to determine if any leaks in the Suppression Pool had been identified. Also, plant records could be reviewed to detect any abnormal nitrogen usage which might indicate leakage of the pool in the inerted containment and/or a visual inspection of the pool could be conducted.

6. Severe accident research has shown that a very important function of drywell sprays is the scrubbing of fission products during the core melt process. This limits the inventory available for release. Through procedures, test results, and system reviews, inspectors should ensure the post-accident availability of drywell sprays.

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Primary Containment Systems

TABLE PRCT-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration, testing and/or preventive or unscheduled maintenance activities, procedures and training and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.

Mission Success Criteria

The main containment systems considered here are the Primary Containment, Standby Gas Treatment System (SGTS), Drywell Sprays, the Suppression Pool, the Secondary Containment and the ~~Drywell Sprays~~ (SGTS). The Primary Containment serves to contain fission products post-accident and consists of the drywell and suppression pool walls and the containment isolation system. From a risk standpoint, small leaks are not a major concern, but large leaks, on the order of the tech spec limit (La) or larger can be very significant to risk. Drywell Sprays are important to ensure H_2 mixing, pressure reduction and removal of fission products from the atmosphere. The Suppression Pool serves to limit containment pressure, scrub fission products, and provide a source of water for the ECCS. The Secondary Containment and the SGTS work together to help ensure any leakage from the Primary Containment is either captured or released through an elevated, filtered vent path. The SGTS also has area coolers to limit temperatures in the various ECCS equipment areas. Since there are no detailed fault trees or minimal cutsets in most PRAs for these containment systems, this inspection plan does not have the detail of the front end systems.

Important Aspects of Containment Systems

1. Emergency procedures and training established to vent containment wetwell (Suppression Pool) during containment overpressure scenarios.

CONDITIONS THAT CAN LEAD TO FAILURE

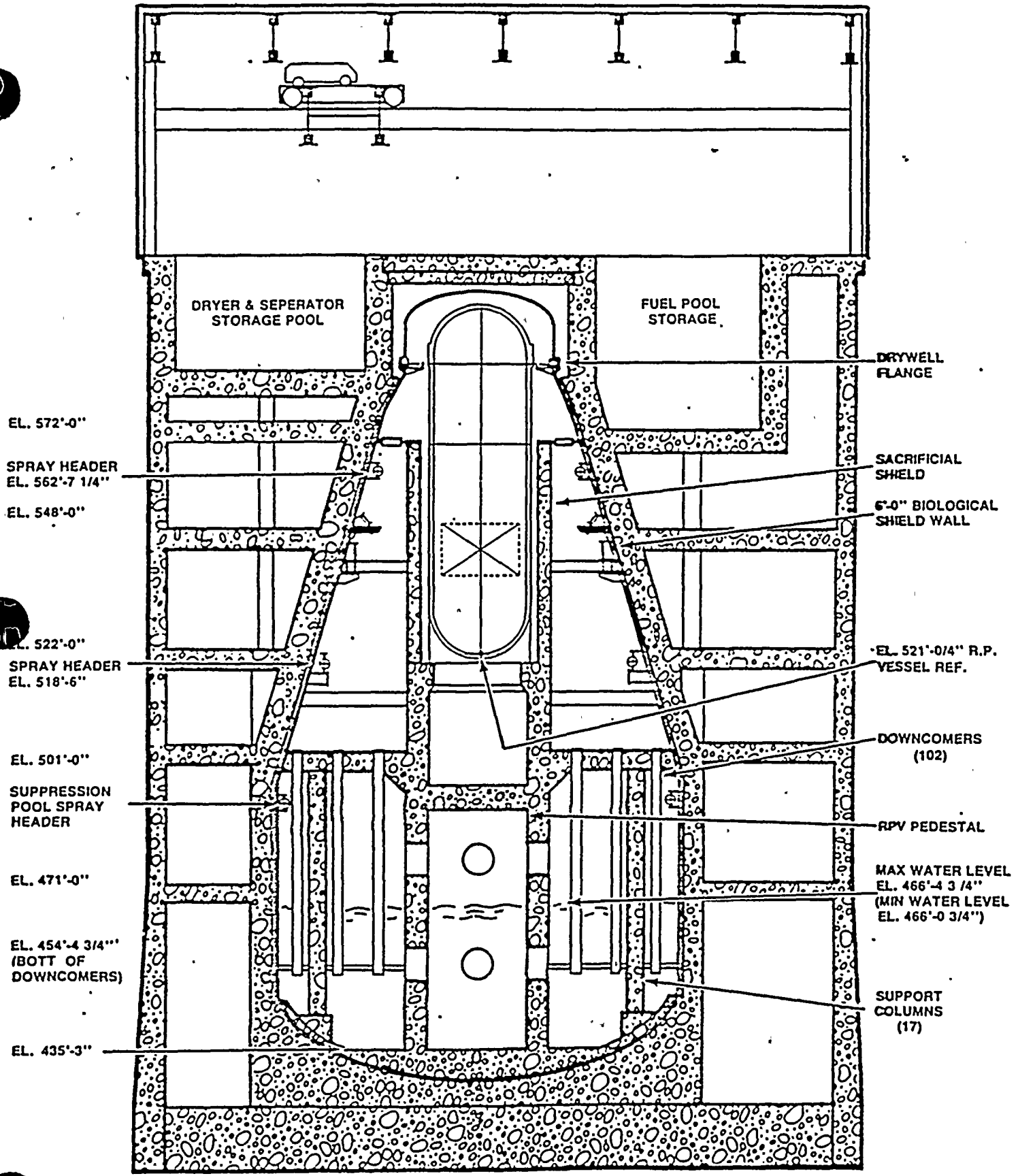
2. Maintaining functionability of SP due to its multiple uses of condensing steam, scrubbing fission products, and providing the ECCS with water.

3. Sequences that bypass containment or result in early containment failure are important to offsite risk. Important areas associated with bypass of containment are containment isolation failure due to valve failures (such as Reactor Building to wetwell vacuum breakers) or gross leakage through containment.

4. One important area associated with early containment overpressure is SP bypass. (The SP bypass leak test addresses this.) Failure modes leading to SP bypass include leakage of the drywell to wetwell vacuum breakers, and rupture or leaks in the downcomer pipes. The drywell to SP differential pressure monitoring instrumentation is important in monitoring the integrity of these boundaries.

5. Suppression Pool Water Unavailable Due to Rupture: Loss of the Suppression Pool water inventory prevents the reactor vessel from being cooled by the ECCS systems. To minimize this occurrence, the results of the containment integrated leak rate tests can be reviewed to determine if any leaks in the Suppression Pool had been identified. Also, plant records could be reviewed to detect any abnormal nitrogen usage which might indicate leakage of the pool in the inerted containment and/or a visual inspection of the pool could be conducted.

6. Severe accident research has shown that a very important function of drywell sprays is the scrubbing of fission products during the core melt process. This limits the inventory available for release. Through procedures, test results, and system reviews, inspectors should ensure the post-accident availability of drywell sprays.



RPV AND CONTAINMENT VESSEL

FIGURE 1

831471.3A
JAN 1984

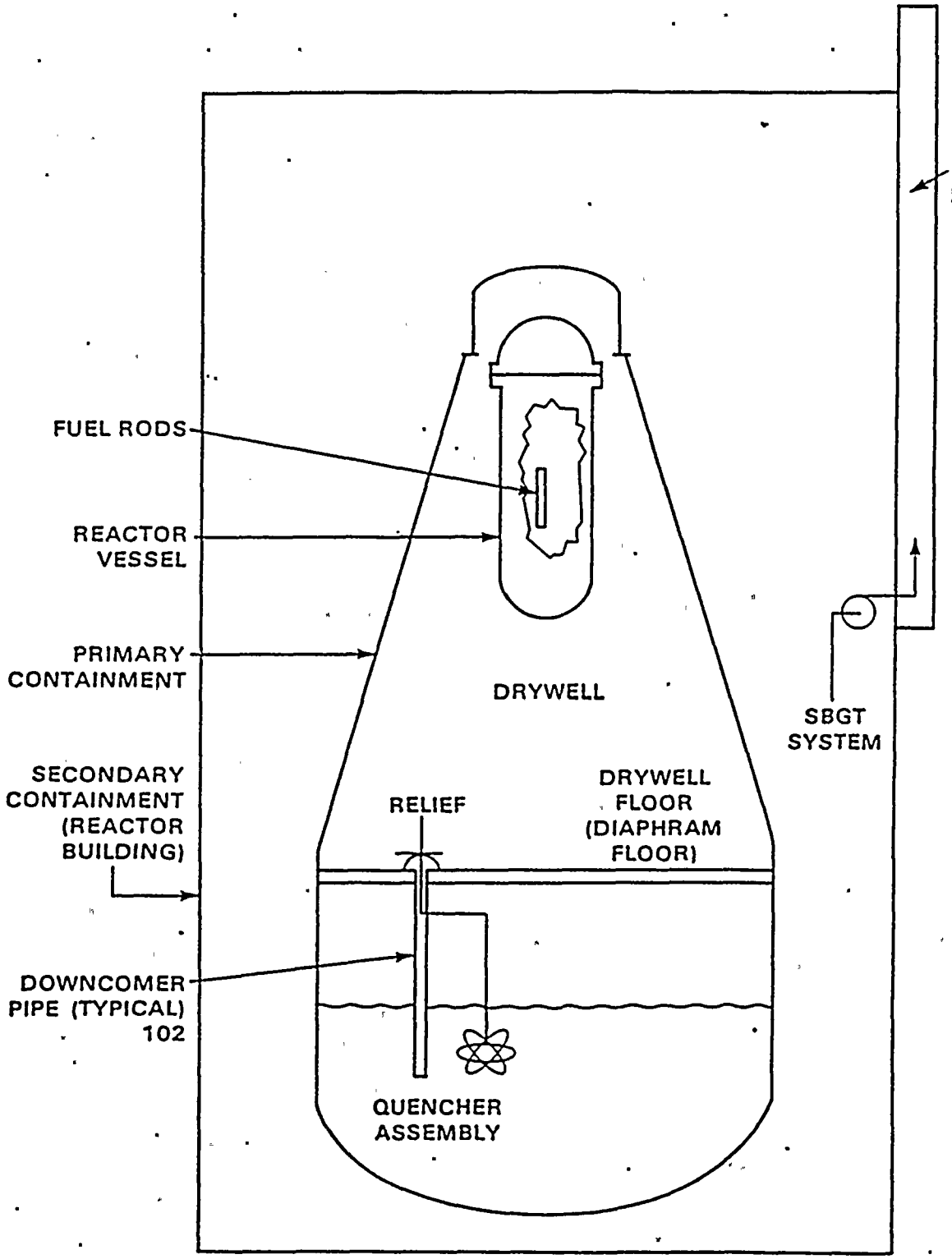


FIGURE 2. CONTAINMENT CONCEPT

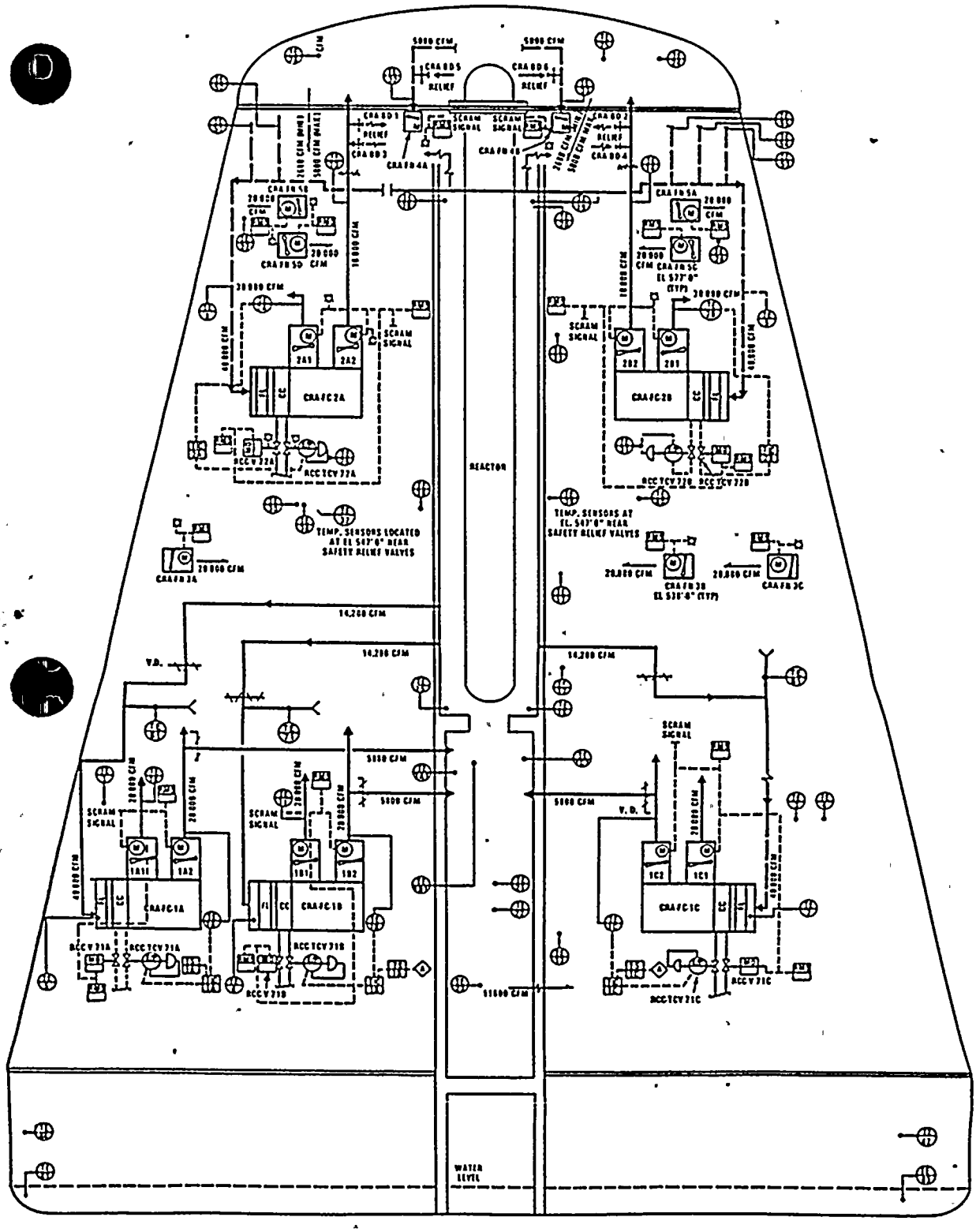


FIGURE 16A. PRIMARY CONTAINMENT COOLING SYSTEM

831471.2A
DEC 1985

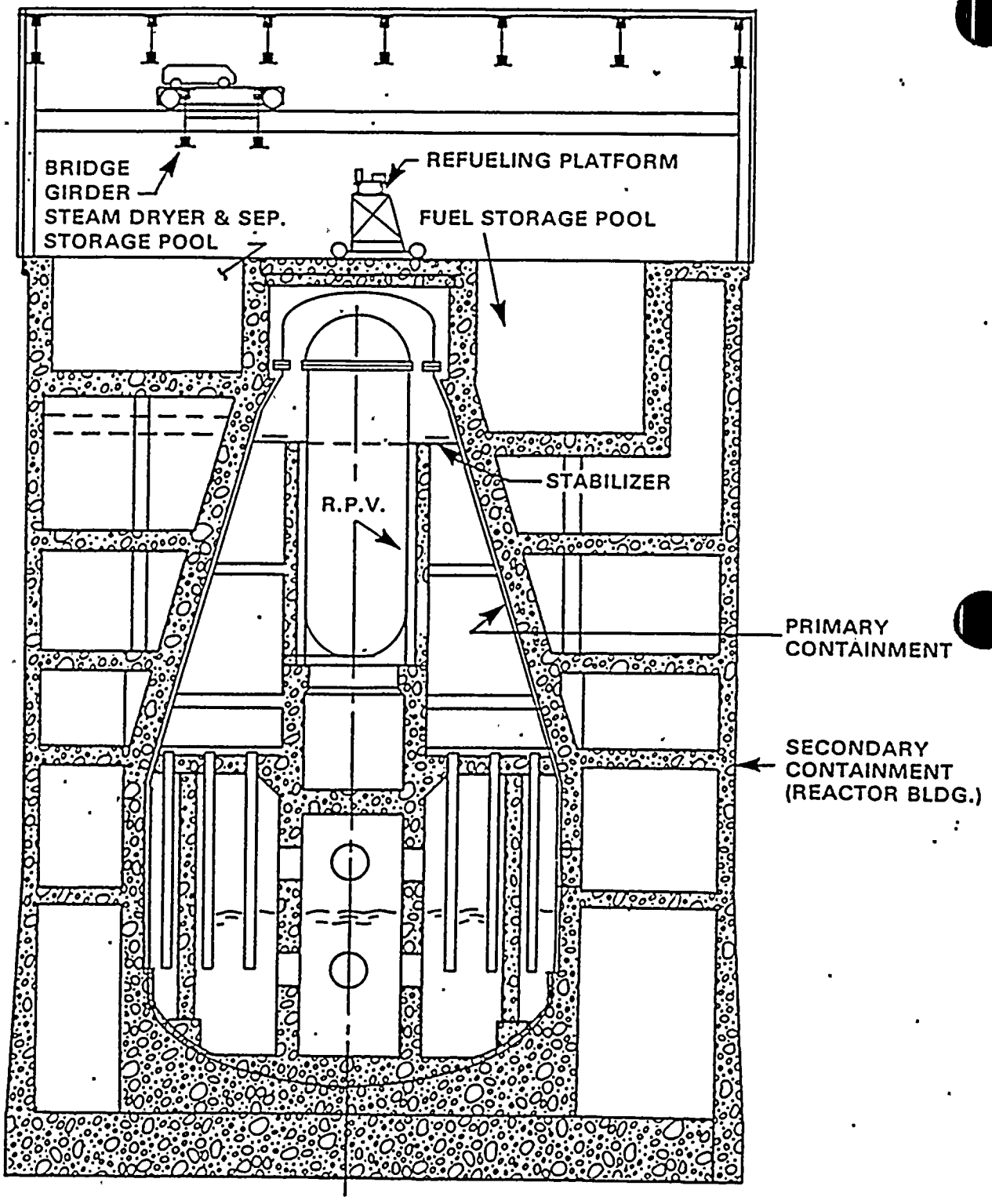


FIGURE 1. PRIMARY AND SECONDARY CONTAINMENT

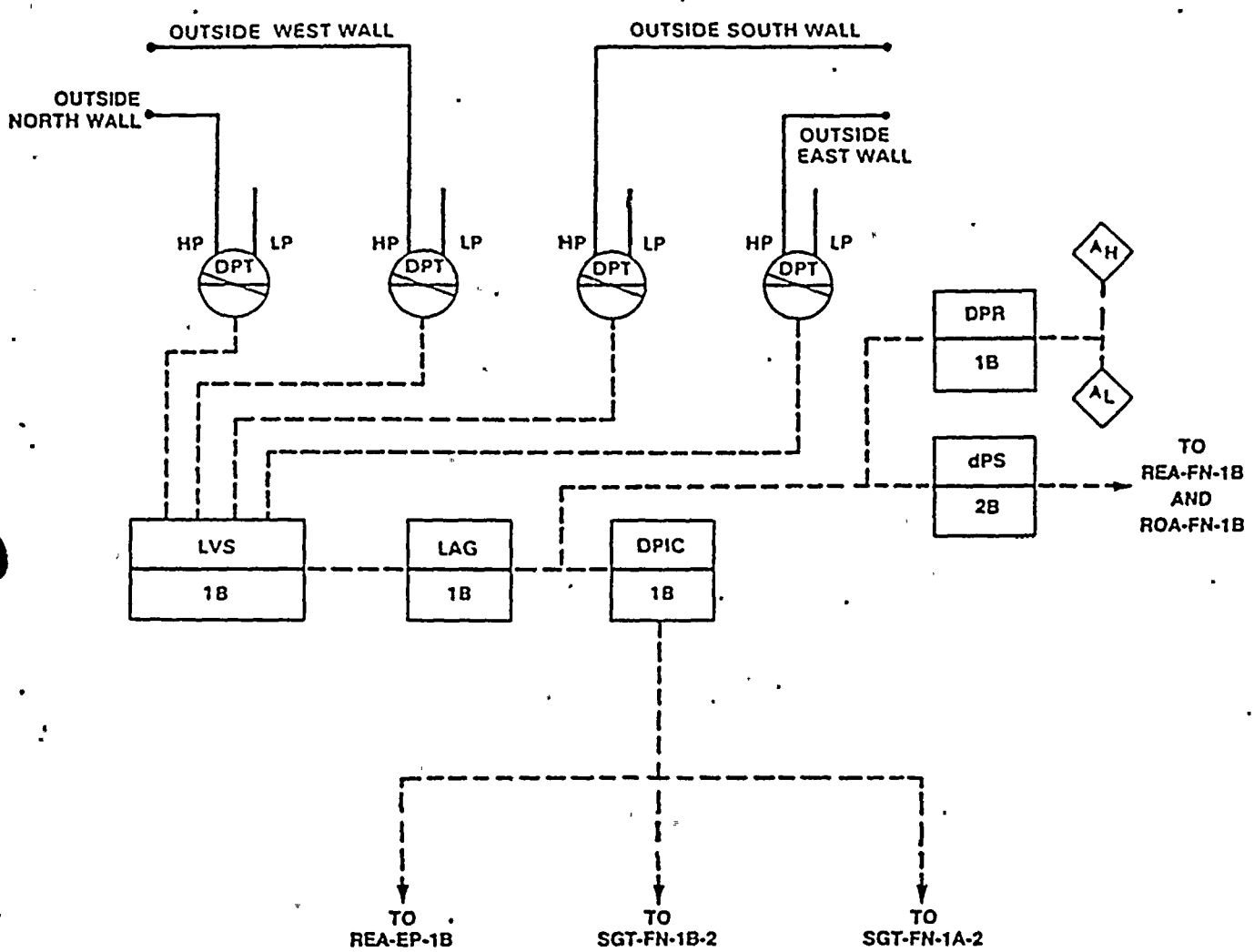


FIGURE 7 - SECONDARY CONTAINMENT PRESSURE CONTROL SYSTEM "B"

851264.2A
DEC 1985

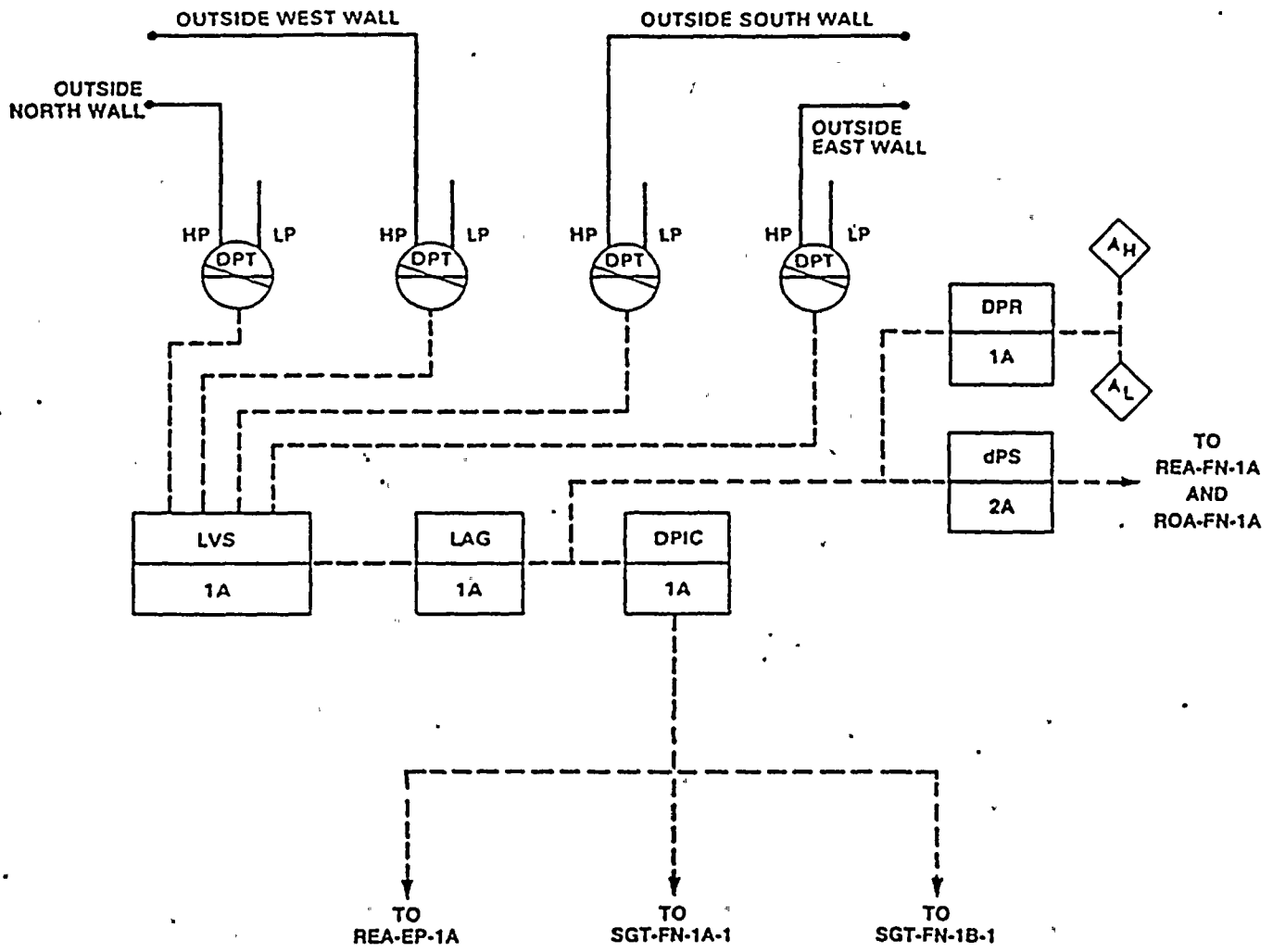


FIGURE 8 - SECONDARY CONTAINMENT PRESSURE CONTROL SYSTEM "A"

851264.3A
DEC 1985

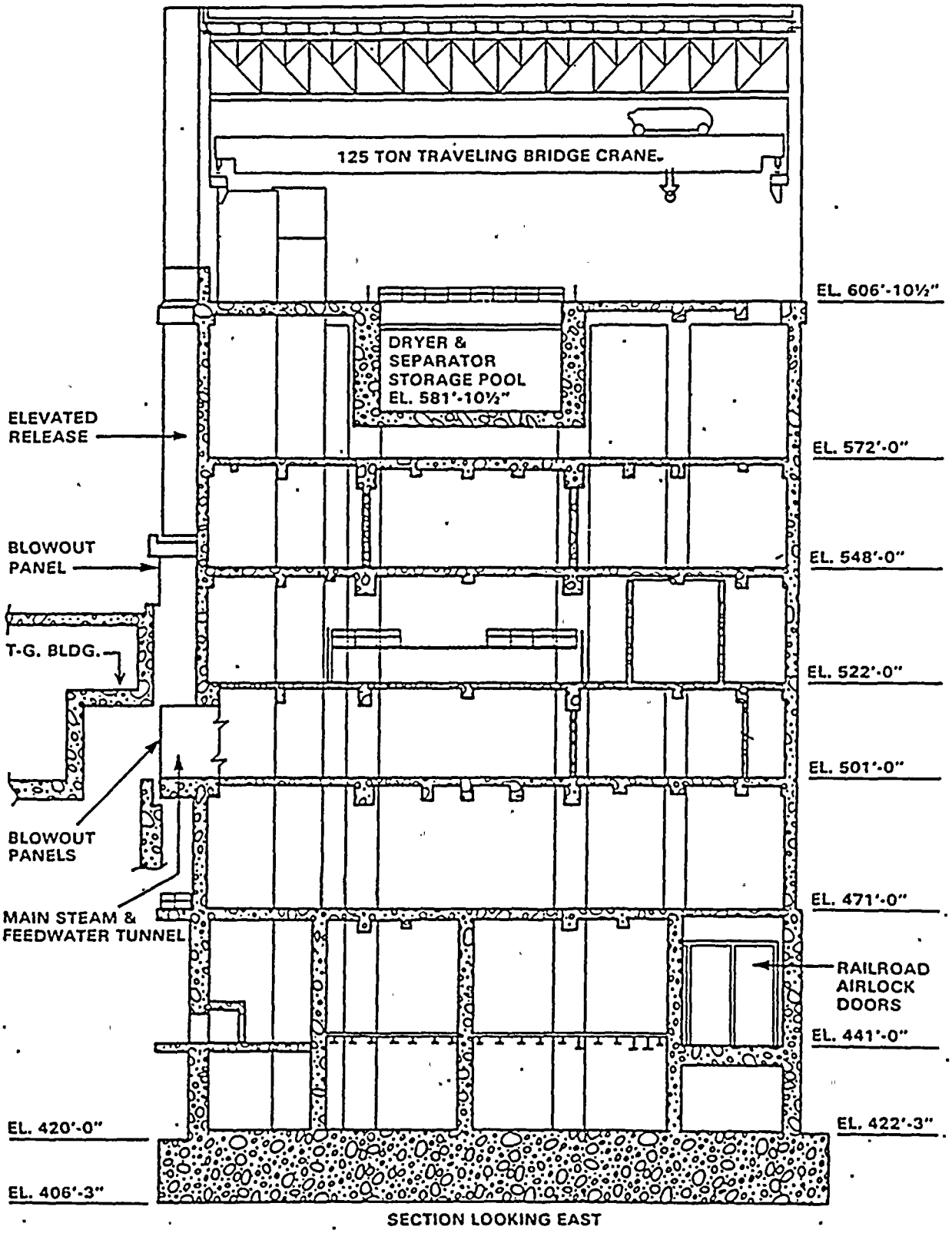


FIGURE 9. REACTOR BUILDING

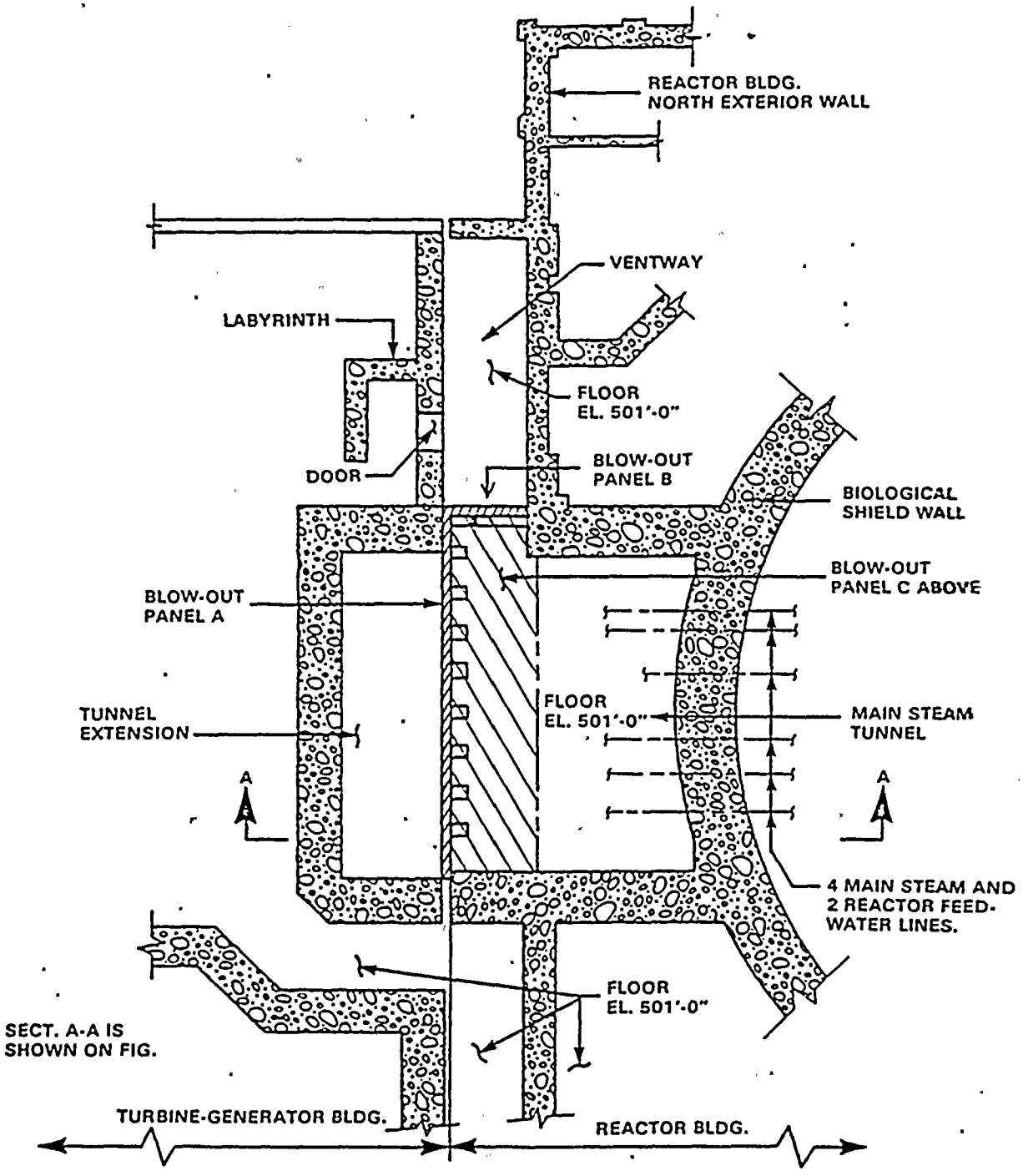


FIGURE 10. MAIN STEAM TUNNEL VENTWAY AND TUNNEL EXTENSION (TOP VIEW)

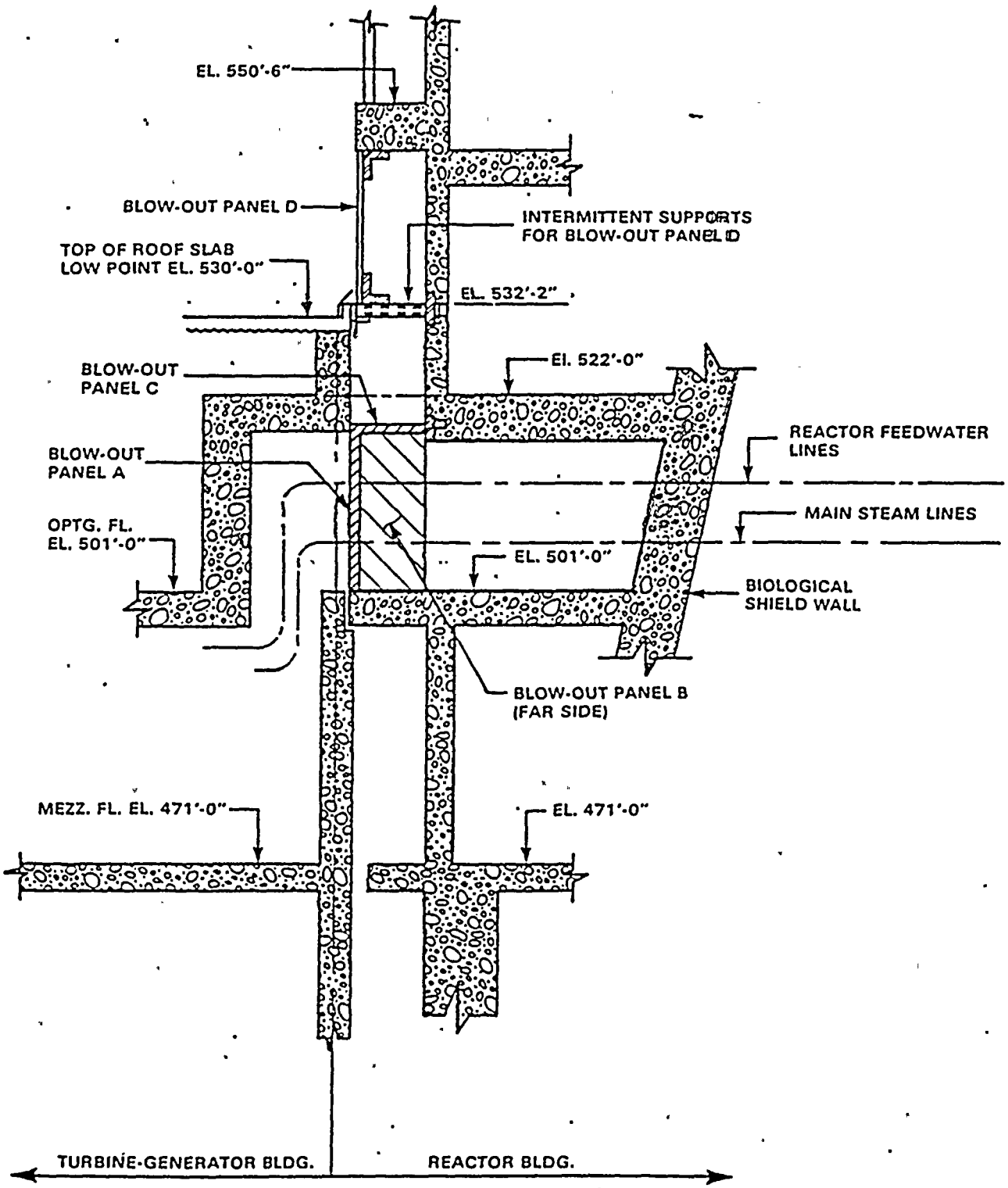


FIGURE 11. MAIN STEAM TUNNEL, VENTWAY AND TUNNEL EXTENSION (SECTION VIEW - FACING EAST)

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

High Pressure Core Spray (HPCS) System

TABLE HPCS-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration, testing and/or preventive or unscheduled maintenance activities, procedures and training and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.

Mission Success Criteria

LATER

Failure Conditions

1. HPCS Pump P-1 or Diesel (DG-3) Fails to Start and Run or Fails on Restart. (PT,MT)

   See Table EP-4 for proposed inspection plan of diesel-generators.

TABLE HPCS-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

2. HPCS in Maintenance. (MT,TS)

3. Failure to Maintain HPCS Discharge Fill System Pump HPCS-P-3 in Operation Causing Piping Damage Upon Start of HPCS Pump P-1. (OP)

4. Loss of Service Water to HPCS Diesel. (PT,MT)

   The HPCS diesel is designed to be capable of operating without service water to the engine heat exchangers for a minimum of one (1) minute, fully loaded. Loss of SW can be caused by failure of:

   - HPCS Service Water Pump HPCS-P-2
   - HPCS Water Leg Pump
   - SW-MOV-4C Fails to Open

5. HPCS Pump P-1 Discharge Line MOV-V-4 Fails to Open or No Output from Control Circuit. (PC,PT,MT)

6. Lube Oil Cooler Heat Exchanger Leakage or Oil Pumps Fail to Supply Starting Lube Oil. (PT,MT)

   Engine Driven lube-oil pumps for:

   - Main Lubricating Oil System (P-7)
   - Piston Cooling System (P-8)
   - Scavenging Oil System (P-9)

   An independent AC circulating pump and standby DC motor driven soak back pump provide pre-lubrication of the turbocharger before engine start-up and run continuously during shutdown while an immersion heater in the lube oil cooler water side maintains oil temperature at 135°F during shutdown.

7. Loss of HPCS Pump Motor or HPCS Diesel Room Cooling. (PT)

   Service Water Valve MOV-54 failing to open prevents cooling water to HPCS Pump Room (RRA-C-4).

8. Initiation and Isolation Logic Testing Outage (PT)

   Initiation signals: 1.65 psig drywell pressure
   Reactor water level 2 (-50")
   Manual pushbutton
   Undervoltage on SM-4 (HPCS diesel)

   HPCS suction auto shift to suppression pool on high pool level 466'-8" or CST level at 448'-3" HPCS diesel trip functions .
   HPCS pump/motor room HVAC/HiRad isolation functions (?)

TABLE HPCS-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

9. False Signals or Miscalibration of Sensors. (PC,PT)

   Applies to same functions as in 8 above.

10. Failure of Relay Logic for Suppression Pool or CST Level. (PC,PT)

    See 8 above.

11. HPCS Not Reset for Auto Operation. (OP)

12. Plugging of Spargers/Clogged Suppression Pool Strainers on HPCS Pump Suction Line. (PT,MT,OP)

13. Failure to Properly Restore Components After Test or Maintenance. (PT,MT)

    - HPCS-V-51 injection line isolation valve (inside drywell)
    - HPCS-V-5 testable check valve (inside drywell)
    - HPCS-V-1 suction MOV from CST
    - COND-V-9A,9B condensate supply (from CST) COND-P-3.4.5

14. Loss of HPCS Safety Function by Failure to Follow Procedures Properly or Inadequacy of Procedures. (OP,TS)

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

High Pressure Core Spray (HPCS) System

TABLE HPCS-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS	FAILURE MODES
61725	Surveillance Testing and Calibration Program	HPCS pump/motor, HPCS diesel, MOVs, HPCS-V-4, SW-V-4, SW-V-4C, SW-V-54	1,4-10, 12, 13
61726	Monthly Surveillance Observation	HPCS water leg pump, HPCS discharge fill pump, CST valves V-9A, 9B; HPCS-V-1, HPCS-V-51, V-5	
71707	Operational Safety Verification		
71710	ESF System Walkdown		
62702	Maintenance		
62703	Monthly Maintenance Observation		
53051	Instrument Components and Systems-Procedure Review	Level, pressure temperature sensors	5,7-10
53053	Instrument Components and Systems-Work Observation		
53055	Instrument Components and Systems-Record Review		
56700	Calibration		
41700	Training	All	9-14

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Reactor Core Isolation Cooling (RCIC) System

TABLE RCIC-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic testing and/or preventive or unscheduled maintenance activities and procedures and/or normal and emergency operating procedures, training, and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
TS - Technical specifications.

Mission Success Criteria

LATER

Failure Conditions

1. RCIC Pump P-1 or RCIC Turbine DT-1 Fails to Start and Run or Fails on Re-start. (PT,MT)

2. RCIC in Maintenance. (MT,TS)

3. Failure to Maintain RCIC Water Leg Pump RCIC-P-3 in Operation Causing Damage Upon Start of RCIC Pump P-1. (OP) Can also be caused by valves failing to remain open.

- V-60 Water Leg Pump Suction Valve
- V-62 Water Leg Pump Discharge Valve
- V-62 Water Leg Pump Recirculation Valve

4. Leakage or Rupture of Turbine Exhaust Line Rupture Disks. (ISI,PT)

5. RCIC° Pump Suction /Discharge Line MOV Fails to Open or No Output from Control Circuit. (PT,MT)

   - V-31 RCIC-P-1 Suppression Pool Suction Isolation MOV
   - V-13, Head Spray Line Isolation MOV
   - V-65 Testable (AO) Check Valve to Reactor Head Spray

6. RCIC Steam Supply Isolation MOV Fails to Open or No Output from Control Circuit. (PT,MT)

   - V-45, Steam to RCIC-P-1 Turbine Isolation MOV

7. Lube Oil Cooler HX Leakage or Oil Pump Fails to Supply Starting Lub Oil. (PT,MT)

8. Lube Oil Cooling Water Isolation MOV, V-46, Fails to Open or No Output from Control Circuit. (PT,MT)

   - V-46 Auxiliary Cooling Water Supply Isolation MOV

9. Initiation and Isolation Logic Testing Outage. (PT,TS)

   Initiation: Reactor Water Level 2 (-50")
   Manual pushbutton

   Isolation: RCIC Equipment Area and/or Pipe Routing Area High Temperature (130°F)

   RCIC Equipment Area High Differential Temperature (40°F)

   Low Steam Supply Pressure (62 psig)

   Exhaust Diaphragm High Pressure (10 psig)

   RCIC High Steam Flow or Instrument Line Break (283%)

   Combined RCIC and RHR High Steam Flow (118%)

   RCIC Turbine Trip

   - Manual pushbutton on P-601
   - Overspeed mechanical (125%)
   - Overspeed electrical (125%)
   - Turbine high exhaust pressure (25 psig)
   - Low pump suction pressure (20" VAC)
   - Local manual trip

10. False Signals or Miscalibration of Sensors. (PC,PT)

    Applies to same functions as in 9 above.

11. Failure of Relay Logic for Suppression Pool or CST Level. (PC,PT)

    Suppression pool suction valve V-31 opens upon CST level of 448'-3".

    CST suction valve RCIC-V-10 and CST flow test return valves RCIC-V-22 and V-59 to CST auto close when V-31 is open.

12. Loss of Pump/Turbine Room Cooling. (PT,MT)

    Service Water Valve MOV-34 failing to open causes loss of RCIC pump room cooling coil RRA-CC-6.

13. HPCI Not Reset for Auto Operation. (OP)

14. Plugging of Spargers/Clogged Suppression Pool Strainers on HPCS Pump Suction Line. (PT,MT,OP)

15. Failure to Properly Restore Components After Test or Maintenance. (PT,MT)

    - RCIC pump discharge/suction line valves V-66, V-65 (testable check valves) V-12, V-101 (locked open manual valves)
    - RCIC turbine steam supply/discharge line valves V-63, V-8, V-68 (MOVs normally open)
    - Other components as shown on Table RCIC-3.

16. Loss of RCIC Safety Function by Failure to Follow Procedures Properly or Inadequacy of Procedures. (OP,TS)

17. Operator Failure to Extend Battery Life, Water Sources, for RCIC Operatin and Room Cooling Under Extended Station Blackout. (OP)

18. Environmental Effects Due to Steam Line Break. (ISI)

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Reactor Core Isolation Cooling (RCIC) System

TABLE RCIC-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS*	FAILURE MODES
41700	Training	RCIC pump & turbine temperature, pressure level, & speed sensors area temperature sensors, lube oil cooler isolation valve.	3,13,14, 16,17
53051	Instrument Component and Systems-Procedure Review	Temperature, pressure level, speed sensors. Area temperture sensors.	5,6,9-11
53053	Instrument Components and Systems-Work Observation		
53055	Instrument Components and Systems-Record Review		
56700	Calibration		
61725	Surveillance and Calibration Program	RCIC pump & turbine temperature, pressure level & speed sensors, area temperture sensors RCIC discharge valve V-13, lube oil cooling water valve V-46, lube oil cooling water PCV-15, turbine stop valve V-1, turbine control valve, V-2, steamline isolation valves V-45, V-36.	1-2,4-12 14-15,18
61726	Monthly Surveillance Observation		
72700	Startup Testing-Refueling		
71707	Operational Safety Verification		
71710	ESF System Walkdown		

*Refers only to components identified in Tables RCIC-1 and RCIC-3

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Reactor Core Isolation Cooling (RCIC) System

TABLE RCIC-3 MODIFIED SYSTEM WALKDOWN

DRAWING NO: M-519

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
RCIC-V-60 @	RB-422	Water leg Pump Suction Valve	Open		
RCIC-V-62 @	RB-422	Water Leg Pump Discharge Valve	Open		
RCIC-V-67 @	RB-422	Water Leg Pump Recirc. Valve	Open		
RCIC-V-16 @	RB-422	RCIC P-1 Suction Iso	Locked/ Open		
RCIC-V-701	RB-422	RCIC-P-5 Root Iso	Open		
RCIC-V-704	RB-422	RCIC-P-1 Suction Pressure PS-6 Root Isolation	Open		
RCIC-V-619	RB-422	Vent on Suction on Water Leg Pump	Closed		
RCIC-V-101@	RB-422	RCIC-P-1 Discharge Isolation	Locked/ Open		
RCIC-V-728	RB-422	RCIC-P-1 Discharge Inst. Header Isol	Open		
RCIC-V-729	RB-422	Root Isolation RCIC Flow Trans RCIC-FT-3	Open		
RCIC-V-730	RB-422	RCIC-FT-3 Root Isol	Open		
RCIC-V-12 @	RB-422	Supply to Reactor Head Manual Isol	Locked/ Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE RCIC-3 (Cont'd)
DRAWING NO: M-519

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
RCIC-V-46	RB-422	Aux. Cooling Water Supply Isol (MO)	Closed		
RCIC-V-722	RB-422	RCIC-PCV-15 Sensing Isolation	Open		
RCIC-V-725	RB-422	RCIC-PS-1 Root Isol (Cooling Supply)	Open		
RCIC-V-10 @	RB-422	Suction from Cond. Storage Tanks (MO).	Open		
RCIC-V-721	RB-422	RCIC-PS-13 Root Isol (Vacuum Tank Press)	Open		
RCIC-V-49	RB-422	RCIC-P-4 Condensate Pump Discharge Throt. Valve	Open		
RCIC-V-1	RB-422	RCIC-P-1 Trip Throt. Valve (MO)	Open		Mechanical Trip Latched
RCIC-V-2	RB-422	RCIC-P-1 Governor Valve (HO)	Open		
RCIC-V-45	RB-422	Steam to RCIC-P-1 Turbine Isol (MO)	Closed		
RCIC-V-739	RB-422	RCIC-PT-7 Root Isol	Open		
RCIC-V-751A	RB-422	RCIC-LS-10 Root Isol	Open		
RCIC-V-751B	RB-422	RCIC-LS-10 Root Isol	Open		
RCIC-V-38 @	RB-422	RCIC-T-3 Upstream Isolation	Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE RCIC-3 (Cont'd)
DRAWING NO: M-519

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
RCIC-V-39 @	RB-422	RCIC-T-3 Downstream isolation	Open		
RCIC-V-25	RB-422	Supply Steam Drip Pot Outlet Drain Valve (AO)	Open		
RCIC-V-26	RB-422	Supply Steam Drip Pot Outlet Drain Valve (AO)	Open		
RCIC-V-24	RB-422	RCIC Turbine Gland Exhaust Isolation	Open		
RCIC-V-29	RB-422	RCIC Turbine Gland Exhaust Isolation	Open		
RCIC-V-712	RB-422	RCIC-PT-3 Root Iso (Gland Exhaust)	Open		
RCIC-V-707	RB-422	RCIC-PT-8 Root Iso (Turbine Exhaust)	Open		
RCIC-V-710	RB-422	(Same as 711) ?	Open		
RCIC-V-711	RB-422	RCIC-LS-3 Root Iso (Turbine Exhaust Drip Pot)	Open		
RCIC-V-20 @	RB-422	RCIC-T-4 Upstream Iso	Open		
RCIC-V-27 @	RB-422	RCIC-T-4 Downstream Isolation	Open		
RCIC-V-708	RB-422	RCIC-PS-9A Root Isolation (Turbine Exhaust)	Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE RCIC-3 (Cont'd)
DRAWING NO: M-519

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
RCIC-V-709	RB-422	RCIC-PS-9B Root Iso (Turbine Exhaust)	Open		
RCIC-V-713	RB-422	RCIC-PS-12A Root Iso (Turbine Exhaust)	Open		
RCIC-V-714	RB-422	RCIC-PS-12C Root Iso (Turbine Exhaust)	Open		
RCIC-V-715	RB-422	RCIC-PS-12B Root Iso (Turbine Exhaust)	Open		
RCIC-V-716	RB-422	RCIC-PS-12C Root Iso (Turbine Exhaust)	Open		
RCIC-V-127 @	RB-422	RCIC-P-1 Minimum Flow Containment Iso	Locked/		
RCIC-V-19	RB-444	RCIC-P-1 Discharge Minimum Flow (MO)	Closed		
RCIC-V-31	RB-444	RCIC-P-1 Suppression Pool Suction Iso (MO)	Closed		
RCIC-V-69	RB-444	RCIC-P-2 Discharge to Suppression Pool (MO)	Open		
RCIC-V-22	RB-444	CST Flow Test Valve (MO)	Closed		
RCIC-V-59	RB-444	CST Flow Test Valve (MO)	Closed		
RCIC-V-191 @	RB-444	High Head Loss Orifice RCIC-RO-12 Bypass	Locked/ Open		
RCIC-V-74 @	RB-444	Auxiliary Steam Supply	Locked Closed		
RCIC-V-68	RB-444	RCIC Turbine Exhaust Isolation (MO)	Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE RCIC-3 (Cont'd)
DRAWING NO: M-519

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
RCIC-V-110	RB-471	RCIC Turbine Exhaust Vacuum Breaker (80) (MO)	Open		
RCIC-V-113	RB-471	RCIC Turbine Exhaust Vacuum Breaker (~~80~~ 86) (MO)	Open		
RHR-V-102	RB-471	RCIC/RHR System Vacuum Relief Isol	Open		
RHR-V-26A	RB-471	RHR-Loop A Cond. Return (MO)	Locked/ Closed +		
RHR-V-26B	RB-471	RHR-Loop B Cond. Return (MO)	Locked/ Closed +		
RCIC-V-8	RB-511	RCIC Turbine Steam Supply Isolation (MO)	Open		
RCIC-V-64	RB-548	Steam Supply to RHR Drain Line High Point	Locked/ Closed +		
RCIC-V-65	RB-548	Testable Check to RX Head Spray (AO)	Closed		
RCIC-V-13	RB-548	Head Spray Line Iso (MO)	Closed		
RCIC-V-23	RB-548	RHR Head Spray Isolation (MO)	Closed		
RCIC-V-740	RB-536	Root Stop RCIC-V-66 Diaphragm Oper. (AZ 315°)	Locked/ Closed		
RCIC-V 184	RB-536	Root Stop RCIC-V-66 Diaphragm Oper. (AZ 315°)	Locked/ Closed		

@ Requires independent verification of valve position by licensee personnel.
+ Handwheel locked with breaker tagged open.

TABLE RCIC-3 (Cont'd)
DRAWING NO: M-519

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
RCIC-V-742	RB-548	SP-19B Root Isolation	Locked/ Closed		
RCIC-V-19B	RB-548	SP-19B to SR-6 Iso (AO)	Open		
RCIC-V-66	C-596	Testable Check Valve Head Spray Line (AO)	Closed		
RCIC-V-63	C-551	Stm. Iso. to RCIC Turb. & RHR HX (MO)	Open		
RCIC-V-76	C-551	RCIC-V-63 Bypass (MO)	Closed		
COND-V-9A @	CST Area	CST "A" Supply Valve	Locked/ Open		
COND-V-9B @	CST Area	CST "B" Supply Valve	Locked/ Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE RCIC-3 (Cont'd)
DRAWING NO: M-519

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-S1-1D@	RW-467	RCIC-V-46 Turbine Cooling Water Supply 6A	Closed		
MC-S2-1A@	RB RW-471	RCIC-V-1 RCIC Trip Throttle Valve 2B	Closed		
MC-S1-1D@	RW-467	RCIC-V-68 RCIC Steam Exhaust 7A	Closed		
MC-S2-1A@	RB-471	RCIC-V-13 RCIC Pump Discharge 5B	Closed		
MC-S2-1A@	RB-471	RCIC-V-19 RCIC Min. Flow 5C	Closed		
MC-S2-1A	RB-471	RCIC-V-22 RCIC Test Bypass 6B	Closed		
MC-S2-1A	RB-471	RCIC-V-59 RCIC Test Bypass 7A	Closed		
MC-S2-1A@	RB-471	RCIC-V-45 RCIC Steam Supply Valve 8A	Closed		
MC-S2-1A@	RB-471	RCIC-V-64 RCIC Steam to RHR 8B	Locked/ Open		
MC-S2-1A@	RB-471	RCIC-P-2 RCIC Vacuum Pump 9B	Closed		
MC-S2-1A@	RB-471	RCIC-V-4 RCIC Cond. Pump 9C	Closed		
MC-S2-1A@	RB-471	RCIC-V-69 RCIC Vacuum Pump Disch.10C	Closed		
MC-S2-1A	RB-471	RCIC-V-23 RHR Head Spray 3B	Closed		

@ Requires independent verification of valve position by licensee personnel.

TABLE RCIC-3 (Cont'd)
DRAWING NO: M-519

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-S1-2D@	RW-467	RCIC-V-113 (MO-86) RCIC Vacuum Bkr. 5B	Closed		
MC-S1-1D@	RW-467	RCIC-V-110 (MO-80) RCIC Vacuum Bkr. 6B	Closed		
MC-S1-1D@	RW-467	RCIC-V-8 RCIC Steam Isolation Valve 6C	Closed		
MC-S1-1D@	RW-467	RCIC-V-10 RCIC Suction Valve CST 3C	Closed		
MC-S1-1D@	RW-467	RCIC-V-31 RCIC Suction Valve Suppr. Pool 3B	Closed		
MC-7B-A	RB-522	RHR-V-26A Loop-A Cond Return 6B	Tagged Open		
MC-8B-A	RB-522	RHR-V-26B Loop-B Cond Return 6A	Tagged Open		
MC-8B-A@	RB-522	RCIC-V-63, RCIC Steam Supply 9D	Closed		
MC-8B-A@	RB-522	RCIC-V-76 BPV Around RCIC-V-63 6B	Closed		
MC-7B @	RB-522	RCIC Water Leg Pump RCIC-P-3 6C	Closed		

@ Requires independent verification of valve position by licensee personnel.

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Automatic Depressurization System (ADS)

TABLE ADS-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration and testing and/or preventive or unscheduled maintenance activities and procedures, and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.

Mission Success Criteria

LATER

Failure Conditions

1. System fails to auto initiate due to 1) miscalibration of one of three signals: reactor low low water level, high drywell pressure, CS/LPCI pumps operating, or 2) logic circuitry failure such as faulty contacts on actuation channel, sticky relay coil, and 3) operator fails to recover. (PC,PT,OP)

TABLE ADS-1(Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE
2. ADS valves (MS-RV-3D, 4A, 4B, 4C, 4D, 5B, 5C) fail to operate in auto or manual due to 1) common mode test or maintenance error, 2) faulty pilot valves, 3) SOV failure. (PT,MT)
3. Total loss of 125V DC power - normal power supply trip (fuse failure) due to transient and backup bus unavailable or bus transfer fails. (PT,MT,OP)
4. Failure to properly restore system after test or maintenance, such as failure to reopen root valves to Hi Drywell pressure sensor. (PT,MT)

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Automatic Depressurization System (ADS)

TABLE ADS-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS	FAILURE MODES
56700	Calibration	Reactor Low Level Sensors High Drywell Pressure Sensors	1,4
62702	Maintenance (Refueling)	ADS Valves Accumulator Systems	2,3,4
52051	Instrument Components and Systems-Procedure Review	Sensors, Switches, Control Circuitry	1,2,4,
52053	Instrument Components and Systems-Work Observation	Sensors, Switches, Control Circuits	1,2,4,
52055	Instrument Components and Systems-Record Review	Sensors, Switches, Control Circuits	1,2,4,
61725	Surveillance & Calibration Control Program	Control Circuitry	1 -4
71707	Operational Safety Verification	ADS Valves, Accumulator Systems	1-4
41700	Training	ADS Operation	1-4
41701	Requalification Training	ADS Operation	1-4

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Automatic Depressurization System (ADS)

TABLE ADS-3 MODIFIED SYSTEM WALKDOWN

Since most of the failures associated with ADS are miscalibration errors, logic failures, and operator errors, these are not many specific items listed in this walkdown. Observation of the ADS calibration procedures and/or functional test should provide the inspector with some assurance that these failure modes are averted.

	DESCRIPTION	ID NO.	LOCATION	DESIRED POSITION	ACTUAL POSITION
		Control Room			
1.	ADS Annunciation Panel	PNL P601-A2 PNL P601-A3	MCR	No windows illuminated	_____
2.	N_2 supply pressure				
3.	Air supply pressure				_____
4.	ADS DIV 1 & 2 Inhibit Switches	PNL 601	MCR	Normal (Div.1) Normal (Div.2)	_____ _____
5.	Solenoid Control Switches	PNL 628 PNL 631	MCR	Auto(7) (Div.1) Auto(7) (Div.2)	_____ _____
6.	SRV Control Switches	PNL 601	MCR	Auto (18)	_____
7.	Div 1 125V DC Div 2 125V DC	ADS "A" Logic ADS "B" Logic		BKR Closed (S1-1) BKR Closed (S1-2)	_____ _____

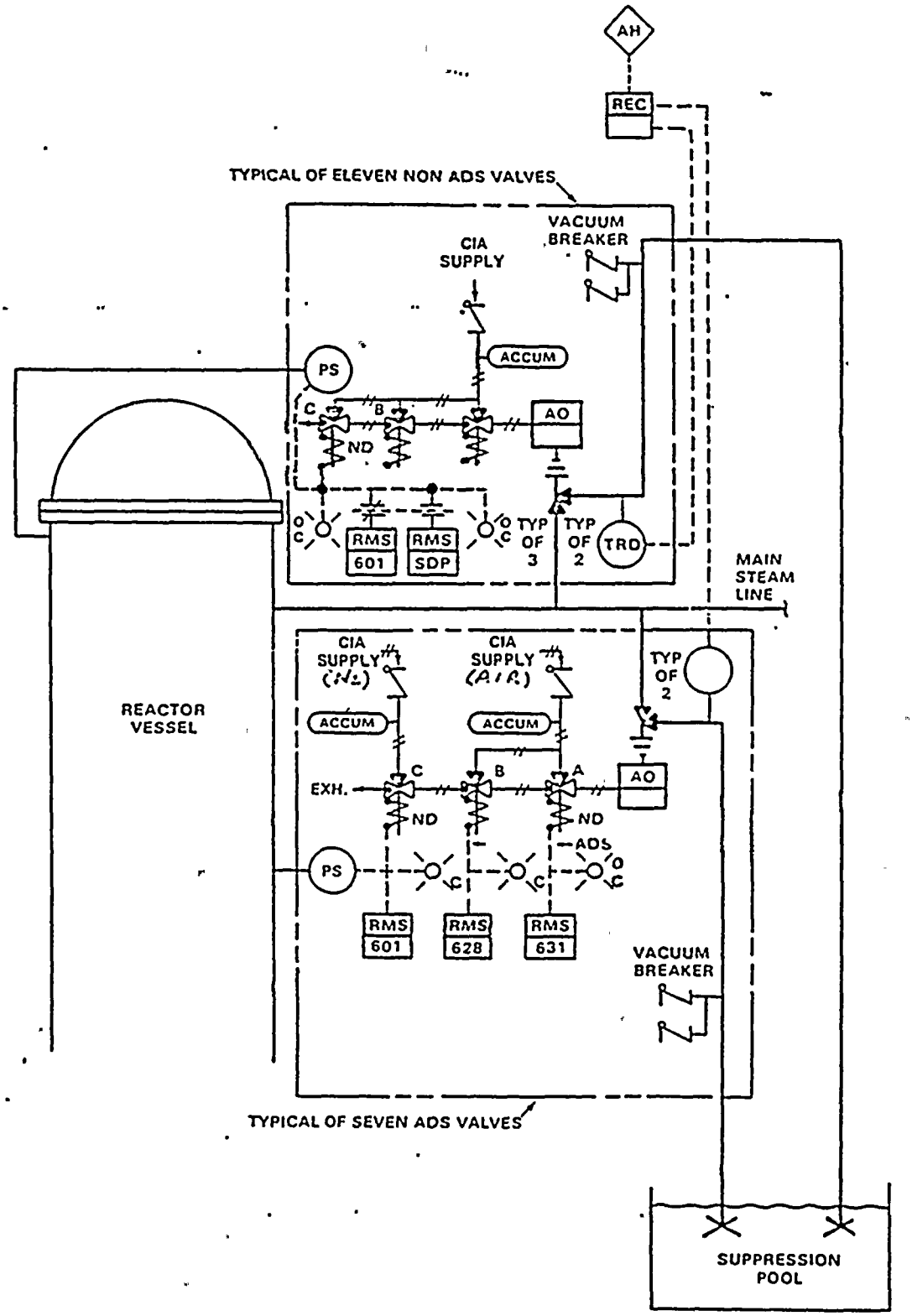


FIGURE 5. SAFETY/RELIEF VALVE CONTROLS

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JUNE 1985

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Residual Heat Removal System (RHRS)
Low Pressure Coolant Injection (LPCI) System

TABLE LPCI-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic testing and/or preventive or unscheduled maintenance activities and procedures and/or normal and emergency operating procedures, training, and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
TS - Technical specifications.

Mission Success Criteria

LATER

Failure Conditions

1. Failure of System to Auto Initiate When Required due to:

   a) Miscalibraton of Sensors - (PC,PT)

      - Hi drywell pressure
      - Lo RPV level

   b) Failure of Logic Circuitry (PT)

TABLE LPCI-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

2. Failure of Valves to Change Position for LPCI Mode and Failure to Manually Recover (PT, MT, OP):

   - Injection Valves V-42A,B,C Fail to Open
   - Heat Exchanger Bypass Valves V-48A,B Fail to Open
   - Suppression Pool Spray Valves V-27A,B Fail to Close
   - Suppression Pool Return Valves V-24A,B Fail to Close
   - Loop C Test Return Valve V-21 Fails to Close
   - Heat Exchanger Level Control Valve V-65A,B Fails to close

3. RHR Pumps 2A, B and C Unavailable Due to Maintenance and/or Failure of Other Pump to Start (Similarly for SW-P-1A,B) (PT,MT)

4. RHR Heat Exchangers Unavailable Due to Plugging, Maintenance, Rupture, Failure of Inlet or Outlet Valves (PT,MT,ISI)

5. Failure to Restore Components to Proper Position After Test or Maintenance (PT,MT,OP):

   - Injection Isolation Valves V-111A,B,C Left Closed
   - Pump Suction MOVs V-4A,B,C Left Closed
   - Pump Discharge Valves V-110A,B Left Closed
   - Pump Suction (Shutdown Cooling Mode) V-6A,B, V-67 Left Open
   - Minimum Flow Isolation Valve V-18,A,B,C Left Closed

6. Human Error-Failure to Take Corrective Action:

   a) LPCI Pumps Manually Shut Off On High Level During Accident and Operator Fails to Recover (OP)

   b) Failure to Start System When Auto Initiation Fails (OP)

7. Failure of Minimum Flow Valves to Control/Close When Required V-64A,B,C (PT)

8. Failure to Maintain Water Leg in Loops (OP,MT):

   RHR-P-3 For Loops B,C: V-82, V-85B,C
   LPCS-P-2 For Loop A: V-85B

9. Loss of Pump Seal Cooling (PT,MT,OP)

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Residual Heat Removal System (RHRS)/Low Pressure
Coolant Injection (LPCI) System

TABLE LPCI-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS*	FAILURE MODES
41700	Training	All	2,5,6,8,9
52051	Instrument Component and Systems-Procedure Review	Reactor Pressure and Level Sensors	1
52053	Instrument Components and Systems-Work Observation		
52055	Instrument Components and Systems-Record Review		
56700	Calibration		
61725	Surveillance and Calibration Program	Reactor Pressure and Level Sensors	1-5,7,9
61726	Monthly Surveillance Observation	Pumps, MOVs check valves, manual valves, heat exchangers	
72700	Startup Testing-Refueling		
71707	Operational Safety Verification		
71710	ESF System Walkdown		
62702	Maintenance (Refueling)	Pumps, MOVs	2-5,8-9
62703	Monthly Maintenance Observation		

*Refers only to components identified in Tables A3-1 and A3-3.

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Residual Heat Removal (RHR)/Low Pressure
Coolant Injection (LPCI)

TABLE LPCI-3 MODIFIED SYSTEM WALKDOWN -

DRAWING NO: M-521

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
		RHR "B" PUMP ROOM UPPER LEVEL			
RHR-V-12B	422'	Pump Seal Leakoff	Open		
RHR-V-13B	422'	Pump Seal Leakoff	Open		
RHR-V-85B	444'	Water Leg Isolation	OPEN		
RHR-V-110B@	444'	Disch. Isolation	Locked Open		
RHR-V-18B@	444'	Min. Flow Isolation	Locked/ Open		Overhead
		RHR "A" PUMP ROOM			
RHR-V-67 @	422'	Loop "C" Cross Tie and Cond Fill	Locked Closed		Overhead
RHR-V-12A	422'	Pump Seal Leakoff	Open		
RHR-V-13A	422'	Pump Seal Leakoff	Open		
		RHR "A" PUMP ROOM UPPER LEVEL			
RHR-V-85A	444'	LPCS Cross-Tie Water Leg Isolation	Open		
RHR-V-110A@	444'	Disch. Isolation	Locked/ Open		
RHR-V-18A @	444'	Min. Flow Isolation	Locked/ Open		Overhead
RHR-V-121	444'	FDR Isolation	Locked/ Closed		Overhead
RHR-V-120	444'	FDR Isolation	Locked/ Closed		
		RHR "C" PUMP ROOM			
RHR-V-109	422'	Condensate Supply	Locked/ Closed		
RHR-V-12C	422'	Pump Seal leakoff	Open		
RHR-V-13C	422'	Pump Seal leakoff	Open		
RHR-V-82	422'	Water Leg Suction	Open		
RHR-V-210 @	422'	Water Leg Min. Flow Isolation	Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE LPCI-3 (Cont'd)
DRAWING NO. M-521

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
		RHR "C" PUMP ROOM UPPER LEVEL			
RHR-V-85C	444'	Water Leg Isolation	Open		
RHR-V-110C@	444'	Disch Isolation	Locked/ Open		
RHR-V-174 @	444'	Flow Test Isolation	Locked/ Open		
RHR-V-18C @	444'	Min. Flow Isolation	Locked/ Open		
RHR-V-172A@	471'	Flow Test Isolation	Locked/ Open		
RHR-V-172B @	471'	Flow Test Isolation	Locked/ Open		
RHR-V-14B @	548'	RHR HX-1B SW Inlet	Locked/ Open		
RHR-V-104 @	548'	RHR to FPC	Locked/ Closed		
RHR-V-14A @	548'	RHR-HX-1A SW Inlet	Locked/ Open		
		DRYWELL			
RHR-V-113 @	501'	Shutdown Cooling Suction Isolation	Locked/ Open		
RHR-V-112 @	514'	Shutdown Cooling Return Isolation	Locked/ Open		
RHR-V-112B@	514'	Shutdown Cooling Return Isolation	Locked/ Open		
RHR-V-111B@	561'	LPCI Injection Isolation	Locked/ Open		
RHR-V-111C@	561'	LPCI Injection Isolation	Locked/ Open		
RHR-V-111A@	561'	LPCI Injection Isolation	Locked/ Open		
		REMOTE OPERATED VALVES-CONTROL ROOM			
RHR-V-4C @	P-601	Suppression Pool Suction	Open		

@ Requires independent verification of valve position by licensee personnel.
~~*RHR-V-111C duplicate valve nubers in licensee valve checklist.~~

TABLE LPCI-3 (Cont'd)
DRAWING NO. M-521

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
RHR-FCV-64C	P-601	Min Flow	Closed		
RHR-V-4B @	P-601	Suppression Pool Suction	Open		
RHR-V-6B	P-601	Pump Suction X-Tie	Closed		
RHR-V-68B	P-601	RHR-HX-1B SW Outlet	Open		
RHR-V-16B	P-601	Lower Drywell Spray	Closed		
RHR-V-27B	P-601	Suppression Pool Spray	Closed		
RHR-V-23	P-601	RHR to Head Spray	Closed		
RHR-V-17B	P-601	Lower Drywell Spray	Closed		
RHR-V-47B @	P-601	RHR-HX-1B Inlet	Open		
RHR-FCV-64B	P-601	Min Flow	Closed		
RHR-V-42C	P-601	LPCI Isolation	Closed		
RHR-V-48B	P-601	RHR-HX-1B Bypass	Open		
RHR-V-3B@	P-601	RHR-HX-1B Outlet	Open		
RHR-V-52B (ل)	P-601	Steam Condensing Mode Steam Inlet SCM	Locked/ Closed		
RHR-V-53B	P-601	Shutdown Cooling Return	Closed		
RHR-V-42B	P-601	LPCI Isolation	Closed		
RHR-V-21	P-601	Flow Test	Closed		
RHR-V-116	P-601	Standby Service Water to Containment Flooding	Closed		
RHR-V-115	P-601	Standby Service Water to Containment Flooding	Closed		
RHR-V-111B	P-601	LPCI Manual Isolation	Open		
RHR-V-112B	P-601	Shutdown Cooling Manual Isolation	Open		
RHR-V-111C	P-601	LPCI Manual Isolation	Open		
RHR-V-49	P-601	RHR Drain to RW	Closed		
RHR-V-9	P-601	Shutdown Cooling Inboard Suction	Closed		

@ Requires independent verification of valve position by licensee personnel.

TABLE LPCI-3 (Cont'd)
DRAWING NO. M-521

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
RHR-V-40	P-601	RHR Drain to RW	Closed		
RHR-V-8	P-601	Shutdown Cooling Supply	Closed		
RHR-V-4A @	P-601	Suppression Pool Suction	Open		
RHR-V-6A	P-601	Pump Suction X-Tie	Closed		
RHR-V-68A	P-601	RHR-HX-1A SW Outlet	Open		
RHR-V-16A	P-601	Upper Drywell Spray	Closed		
RHR-V-27A	P-601	Suppression Pool Spray	Closed		
RHR-V-17A	P-601	Upper Drywell Spray	Closed		
RHR-V-47A @	P-601	RHR-HX-1A Inlet	Open		
RHR-FCV-64A	P-601	Min Flow	Closed		
RHR-V-48A	P-601	RHR-HX-1A Bypass	Open		
RHR-V-24A	P-601	Test Line Isolation	Closed		
RHR-V-3A@	P-601	RHR-HX-1A Outlet	Open		
RHR-V-52A @	P-601	Steam Condensing Mode Steam Inlet SCM	Locked/ Closed		
RHR-V-53A	P-601	Shutdown Cooling Return	Closed		
RHR-V-42A	P-601	LPCI Isolation	Closed		

@ Requires independent verification of valve position by licensee personnel.

TABLE LPCI-3 (Cont'd)
DRAWING NO. M-521

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	- COMMENTS
SM-7	RW-467'	RHR-P-2A	Racked In		Not to be racked in until system is filled and vented.
SM-8	RW-467'	RHR-P-2B	Racked in		Not to be racked in until system is filled and vented.
SM-8	RW-467'	RHR-P-2C	Racked in		Not to be racked in until system is filled and vented.
MC-7B-A 2D	RB-522'	RHR-V-11A	Locked/ Open		
MC-7B-A 3A	RB-522'	RHR-V-6A	Closed		
MC-7B-A-3B	RB-522'	RHR-V-4A	Closed		
MC-7B-A-4D	RB-522'	RHR-V-24A	Closed		
MC-7B-A-5A	RB 522'	RHR-V-42A	Closed		
MC-7B-A-5C	RB-522'	RHR-V-27A	Closed		
MC-7B-A 6A	RB-522'	RHR-V-26A	Locked/ Open		
MC-7B-A 7B	RB-522'	RHR-FCV-64A	CLOSED		
MC-7B-A 7C	RB-522'	RHR-V-124A	Locked Open		
MC-7B-A 7D	RB-522'	RHR-V-124B	Locked Open		
MC-8B-A 2A	RB-522'	RHR-V-9	Closed		
MC-8B-A 2B	RB-522'	RHR-V-6B	Closed		
MC-8B-A 2C	RB-522'	RHR-V-4B	Closed		
MC-8B-A 2D	RB-522'	RHR-V-4C	Closed		

TABLE LPCI-3 (Cont'd)
DRAWING NO. M-521

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-8B-A 3B	RB-522'	RHR-V-125A	Locked/ Open		
MC-8B-A 3C	RB-522'	RHR-V-125B	Locked/ Open		
MC-8B-A 3D	RB-522'	RHR-FCV-64B	Closed		
MC-8B-A 4A	RB-522'	RHR-FCV-64C	Closed		
MC-8B-A 4B	RB-522'	RHR-V-24B	Closed		
MC-8B-A 4C	RB-522'	RHR-V-42B	Closed		
MC-8B-A 4D	RB-522'	RHR-V-42C	Closed		
MC-8B-A 5D	RB-522'	RHR-V-27B	Closed		
MC-8B-A 6A	RB-522'	RHR-V-26B	Locked/ Open		
MC-8B-A 7A	RB-522'	RHR-V-21	Closed		
MC-8B-A 7B	RB-522'	RHR-V-11B	Locked/ Open		
MC-8B-7A	RB-522'	RHR-P-3	Closed		
MC-7B-B-5A	RB-572'	RHR-V-48A	Closed		
MC-7B-B-5B	RB-572'	RHR-V-3A	Closed		
MC-7B-B-6C	RB-572'	RHR-V-52A	Locked/ Open		
MC-8B-B-4D	RB-572'	RHR-V-47B	Closed		
MC-8B-B-5A	RB-572'	RHR-V-48B	Closed		
MC-8B-B-5B	RB-572'	RHR-V-3B	Closed		
MC-8B-B-7C	RB-572'	RHR-V-52B	Locked/ Open		
FRTS/8-81 Power XFER	RW-467' RM-467'	CB8-81 Local Control RHR-V-24B & RHR-V-123A Power Tran	Normal Normal		8-81 BKR CUB C62-P001

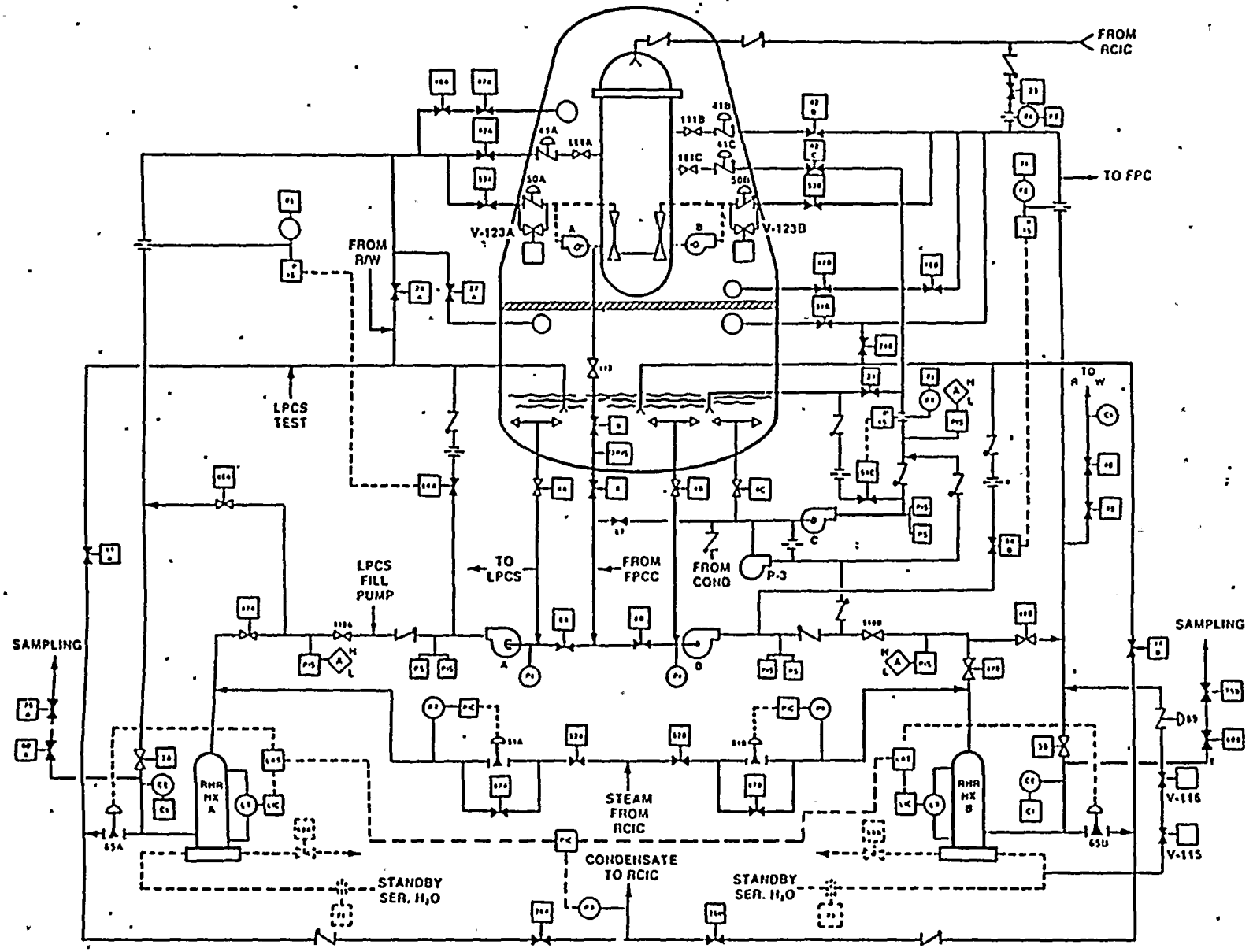

FIGURE 1. RHR SYSTEM
NORMAL STANDBY CONFIGURATION

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JUNE 1985

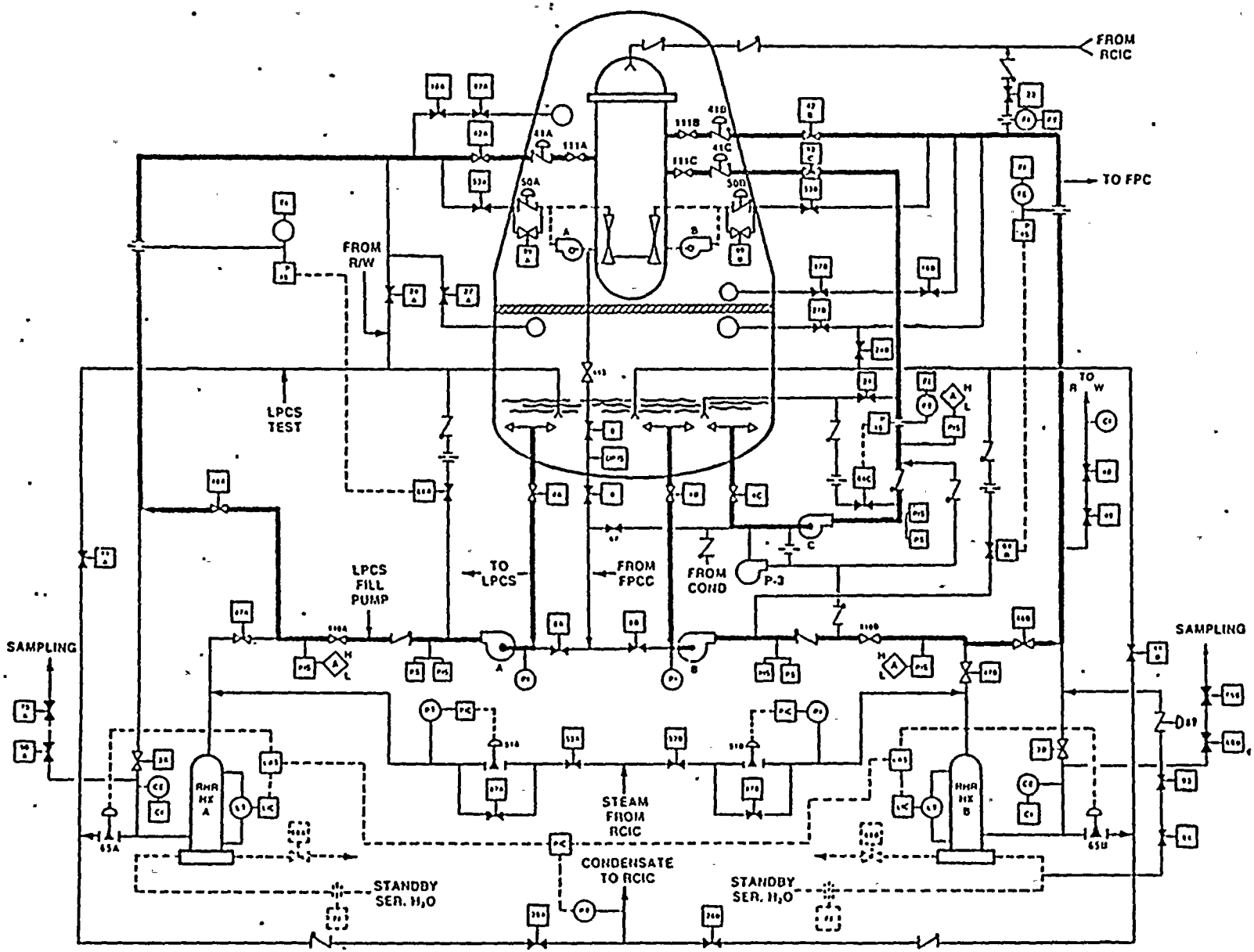

FIGURE 1A. RHR SYSTEM
LPCI MODE

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JUNE 1985

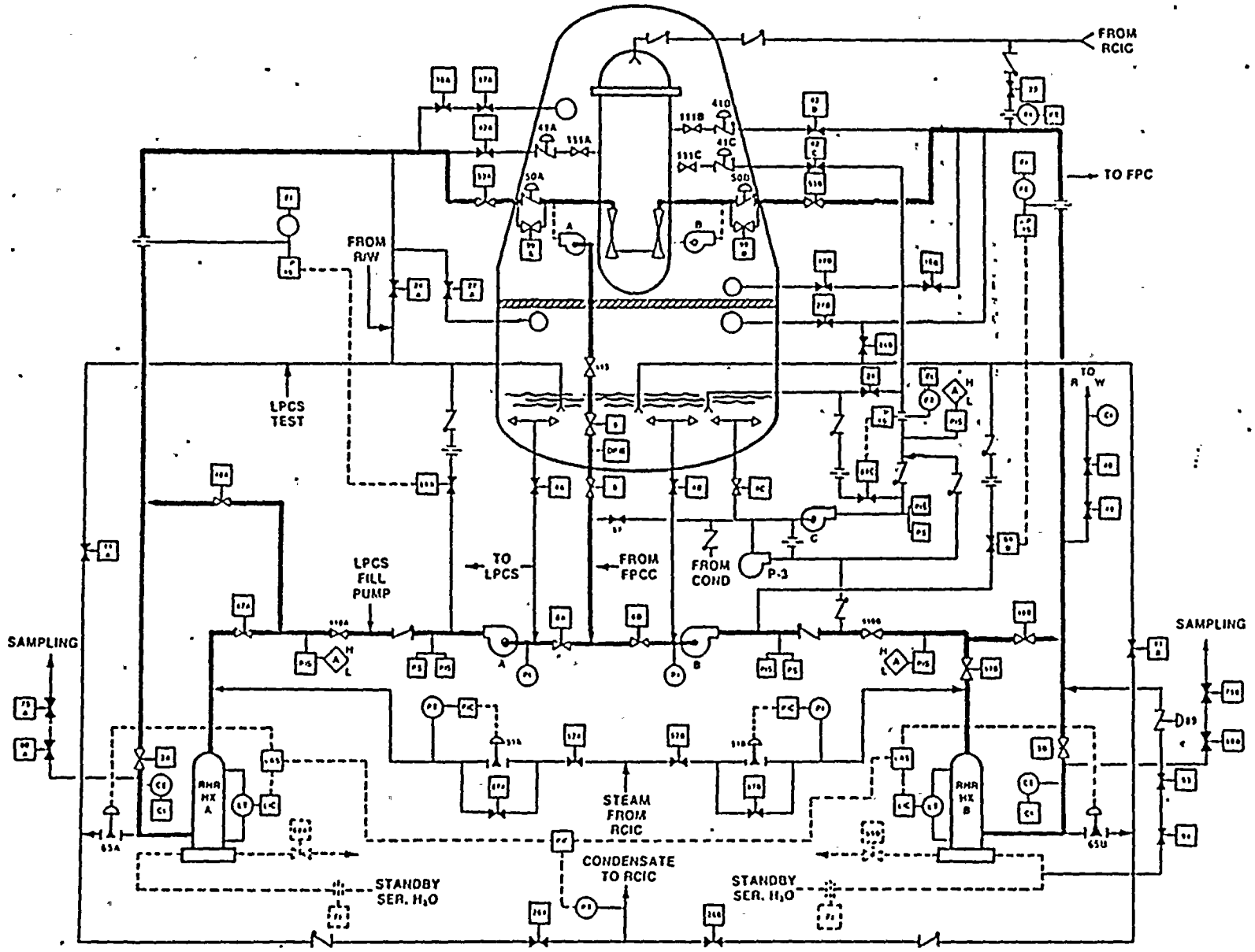

FIGURE 1B. RHR SYSTEM
SHUTDOWN COOLING MODE

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JUNE 1985

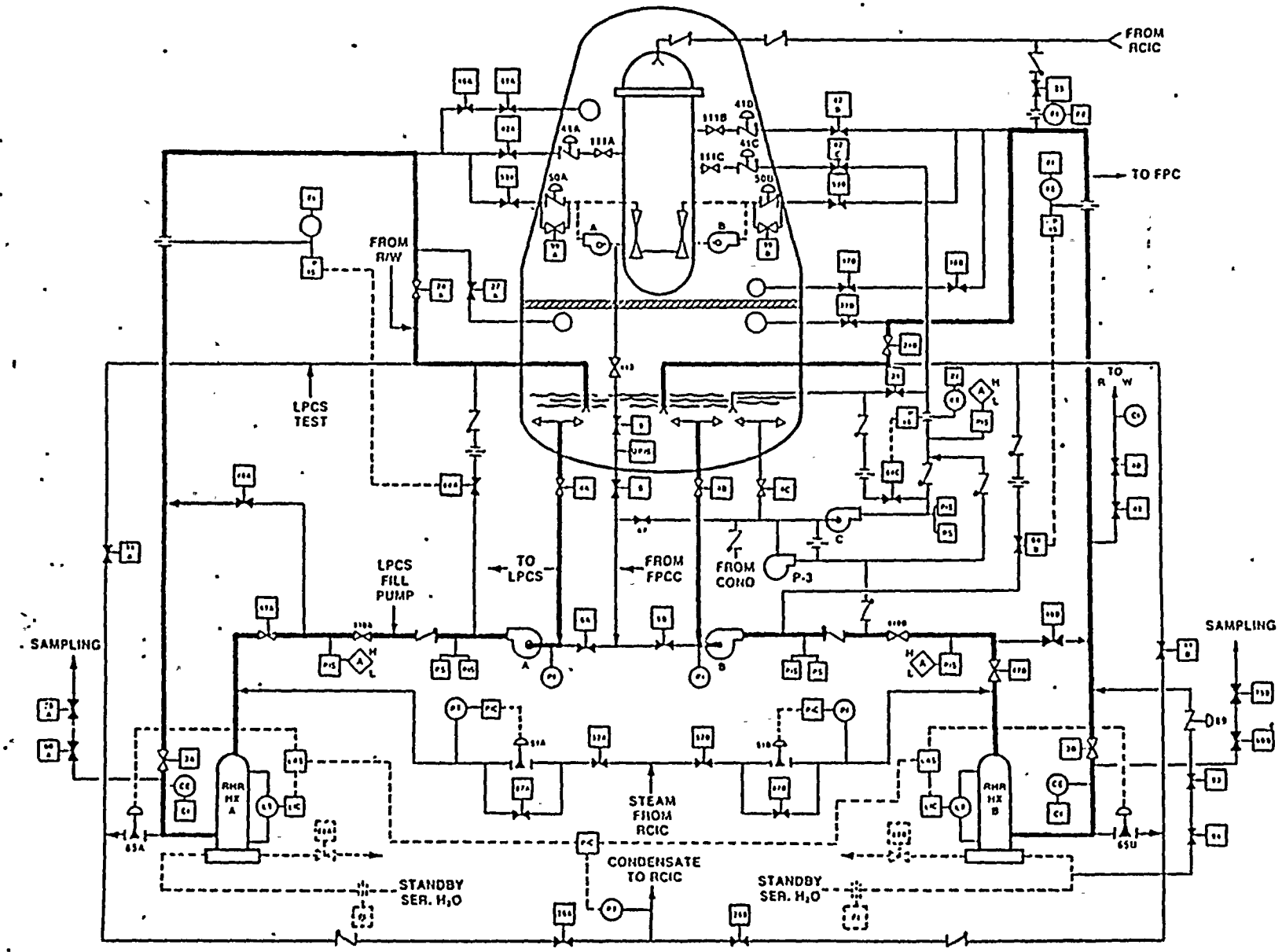

FIGURE 1C. RHR SYSTEM
SUPPRESSION POOL COOLING MODE

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JUNE 1985

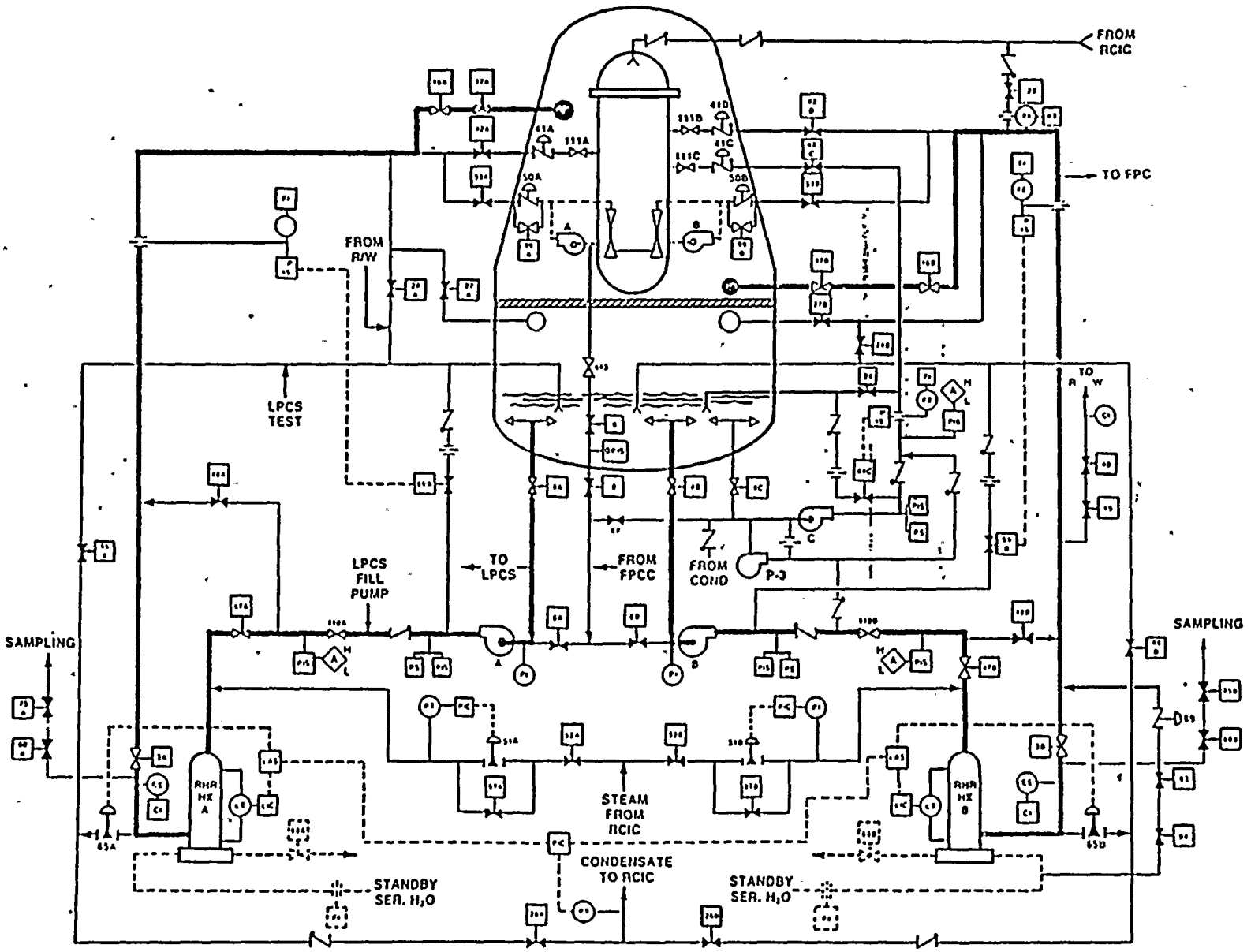

FIGURE 1E/F. RHR SYSTEM
UPPER/LOWER CONTAINMENT SPRAY MODE

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JUNE 1985

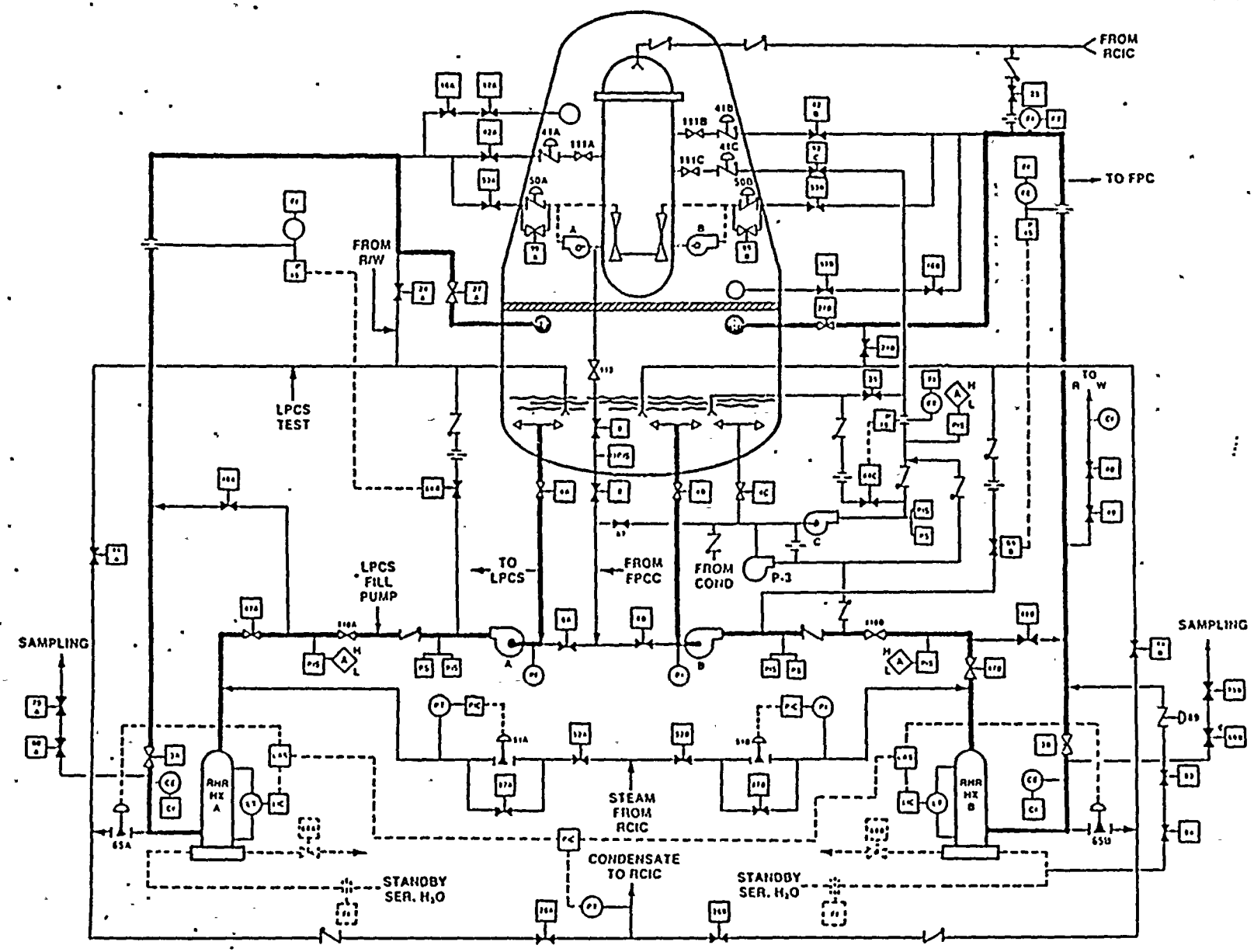

FIGURE 1G. RHR SYSTEM
SUPPRESSION POOL SPRAY MODE

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JUNE 1985

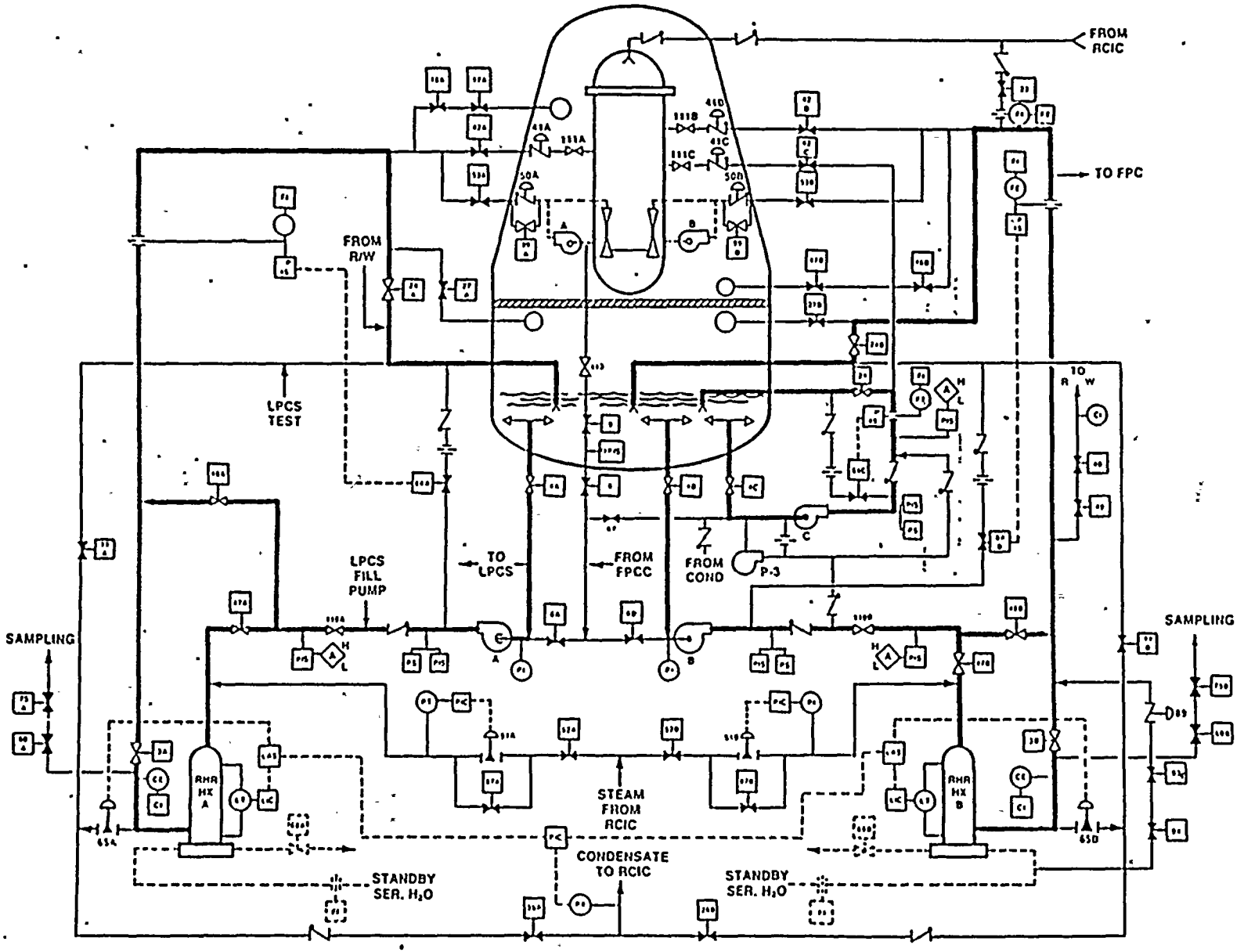

FIGURE 1K. RHR SYSTEM
FULL FLOW TEST MODE

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JUNE 1985

RHR PUMP A, B

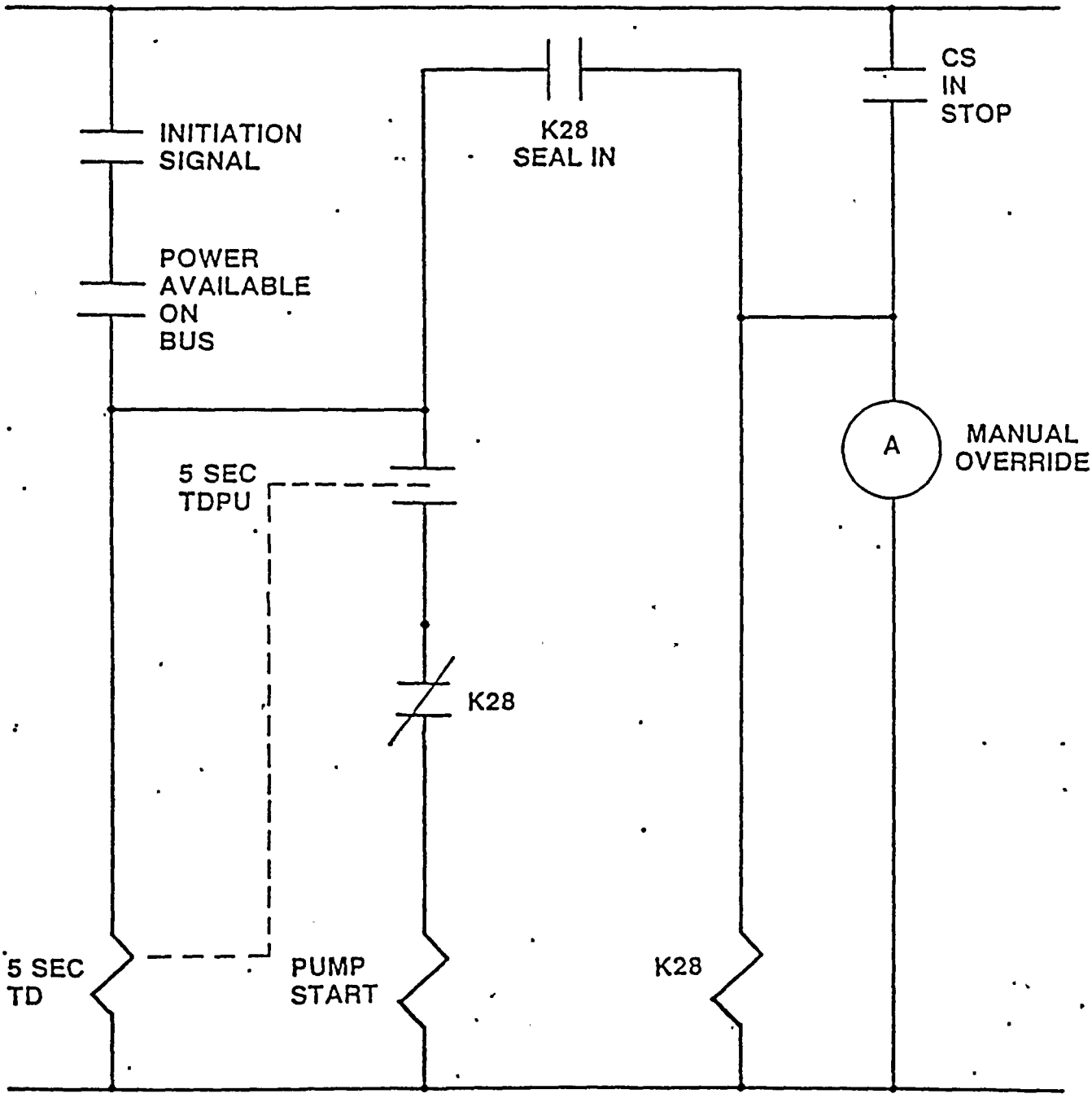

FIGURE 4

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FEB 1984

RHR PUMP C

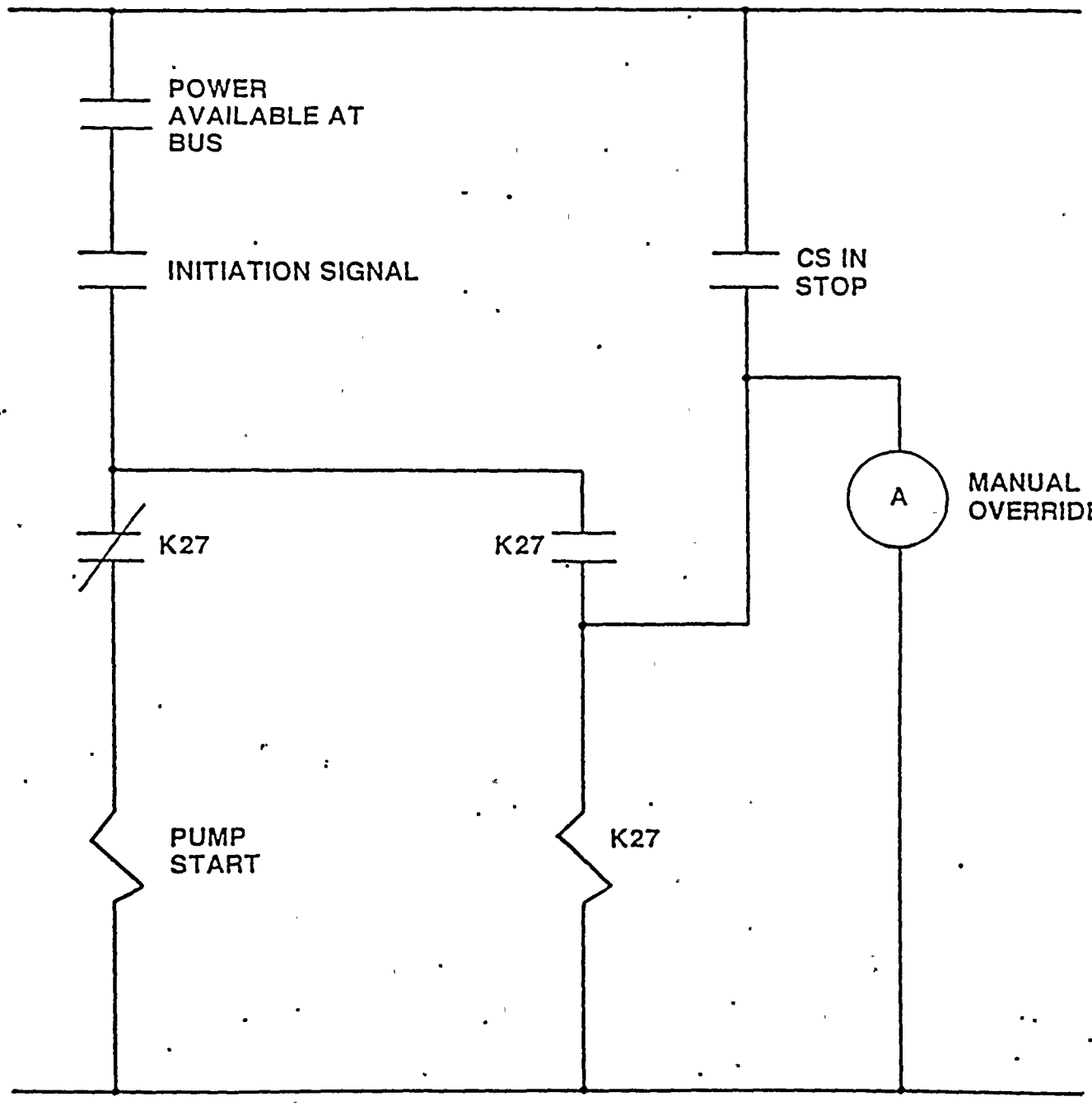

FIGURE 5

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FEB 1984

RHR
INJECTION VALVE V-42 A,B,C

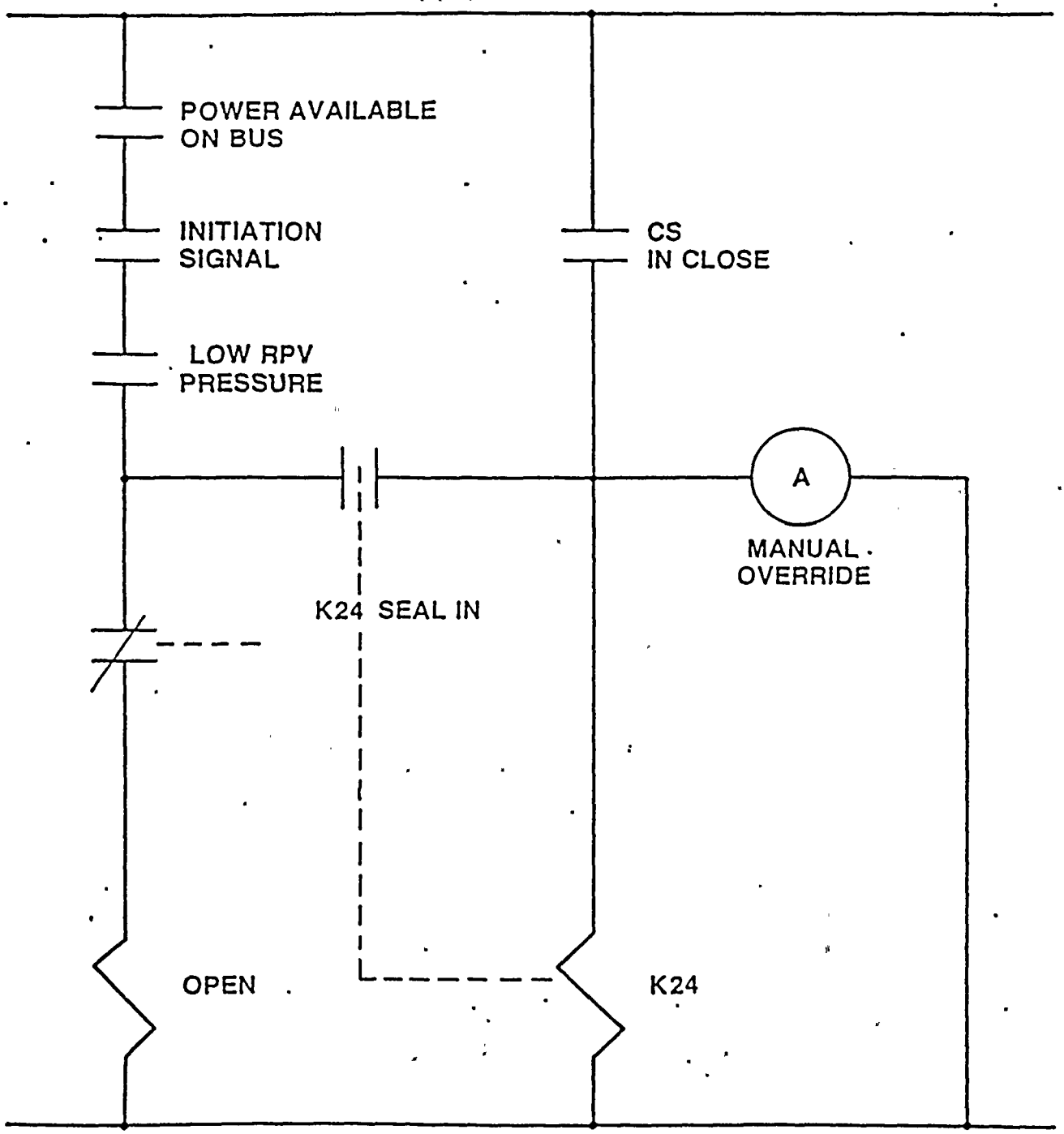

FIGURE 6

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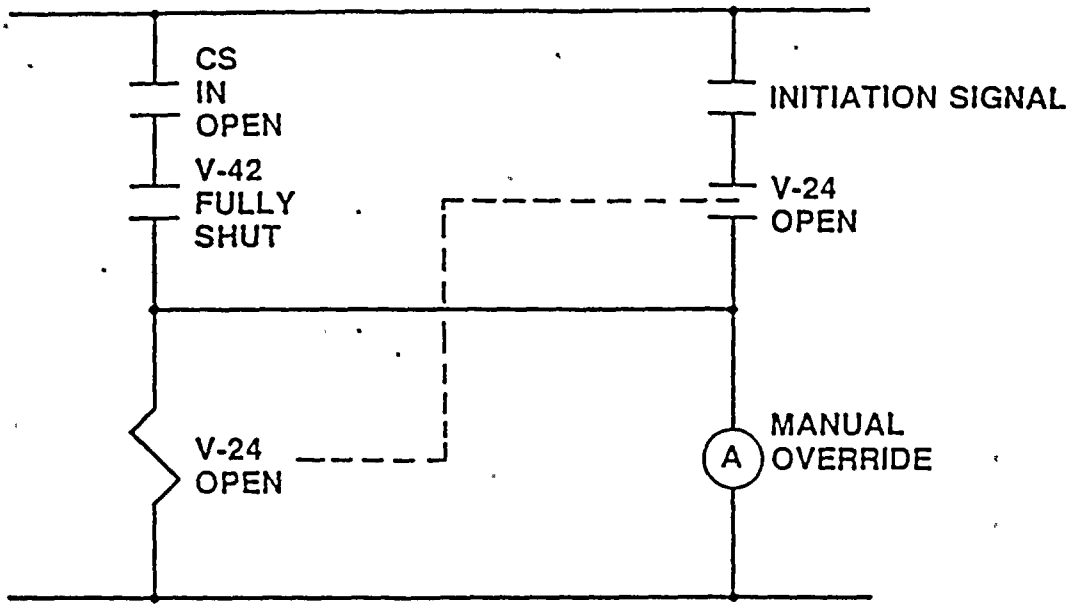
FEB 1984

V-24A,B TEST RETURN



V-27A,B SUPPRESSION POOL SPRAY

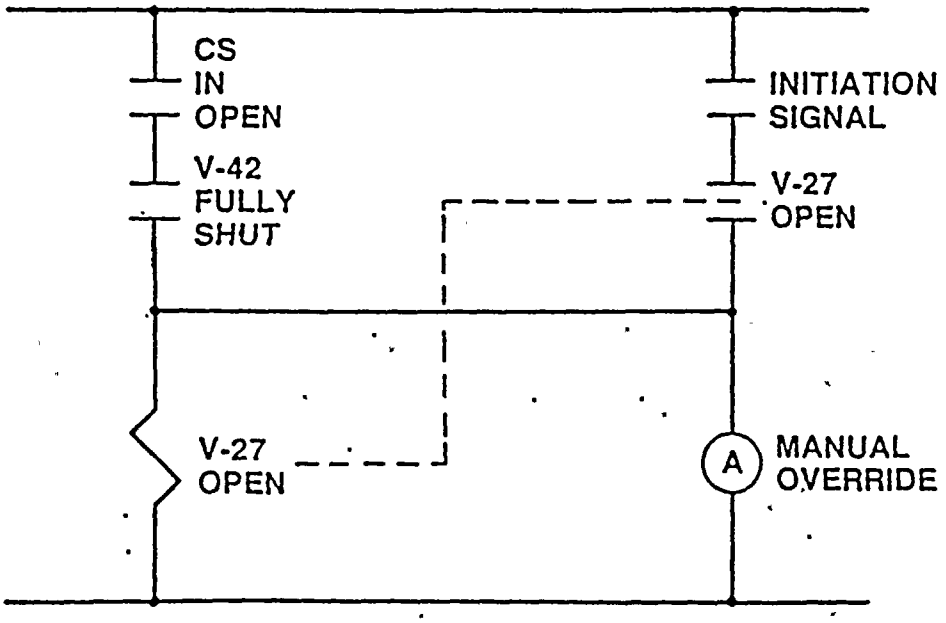


FIGURE 7

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WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Low Pressure Core Spray (LPCS) System

TABLE LPCS-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic testing and/or preventive or unscheduled maintenance activities and procedures and/or normal and emergency operating procedures, training, and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
TS - Technical specifications.

Mission Success Criteria

LATER

Failure Conditions

1. LPCS pump P-1 does not start or run, or in maintenance. (PT,MT,TS)

2. Failure of auto initiation due to: (PC,PT)

   a). miscalibration of reactor water level/drywell pressure sensors.
   b) failure of logic circuitry, i.e., relays.

3. Failure of pump seals on motor due to loss of standby service water cooling. (PT,MT)

TABLE LPCS-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

4. Failure to restore system after test or maintenance: (PT,MT,OP)

   a) LPCS V-51 (injection valve) left closed - manual valves
   b) LPCS V-52 (min. flow) left closed - manual valves
   c) LPCS MOV V-1 (sustain valve) left closed

5. Failure of following valves to change position after initiation signal due to valve failure, control failure, permissive sensor, miscalibration: (PC,PT)
   a) injection valve (MOV) LPCS V-5 fails to open permissive reactor pressure <470 gpm
   b) minimum flow valve (MOV) LPCS V-11 fails to control permissive flow >721 gpm
   c) Test valve (MOV) LPCS V-12 fails to close

6. Failure of, or maintenance on, room cooler - pump room # 5 (PT,MT)

7. Operators fail to recognize following problems: (OP)

   a) no auto initiation, and failure to manually initiate.
   b) pump auto starts, but injection does not take place. Prolonged pump operation through min flow line causes pump damage.

8. Failure to maintain water leg, pump P-2, valves V-32, V-34. (OP)

WASHINGTON NUCLEAR POWER PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Low Pressure Core Spray (LPCS) System

TABLE LPCS-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS*	FAILURE MODES
41700	Training	All	4,7,8
52051	Instrument Components and Systems-Procedure Review	Reactor Low Level Sensors, Drywell High Pressure Sensors, Reactor Vessel Pressure Sensors	2,5
52053	Instrument Components and Systems - Work Observation		
52055	Instrument Components and Systems - Record Review		
56700	Calibration		
61725	Surveillance and Calibration Control Program	Sensors, Pumps, Strainers, Check Valves Manual Valves, Discharge MOVs Suppression Pool	1-6
61726	Monthly Surveillance Observation		
72700	Startup Testing-Refueling		
62702	Maintenance (Refueling)	Pumps, Discharge MOVs, Strainers	1,3,4,6
62703	Monthly Maintenance Observation		
71707	Operational Safety Verification	Pumps, Strainers, MOVs Suppression Pool, Electric Power System	1-6
71710	ESF System Walkdown		

*Refers only to components identified in Tables LPCS-1 and LPCS-3.

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Low Pressure Core Spray (LPCS) System

TABLE LPCS-3 MODIFIED SYSTEM WALKDOWN

DRAWING NO. M-520

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
LPCS-V-32	RB-422	LPCS-P-2 Suction Valve	Open		
LPCS-V-34	RB-422	LPCS-P-2 Discharge Isolation Valve	Open 1/4 Turn		
SW-V-48	RB-422	Motor Cooling Inlet	Open		
LPCS-V-49	RB-422	LPCS-P-1 Pump Vent	Closed		
SW-V-49	RB-422	Motor Cooling Outlet	Throt.		4 GPM
LPCS-V-41	RB-422	LPCS-P-1 Seal Vent Isolation Valve	Locked Open		
LPCS-FCV -11	RB-422	Minimum Flow Control Valve (MO)	Closed		
LPCS-V-52 @	RB-422	Minimum Flow Line Isolation	Locked Open		
LPCS-V-1@	RB-441	Suction Isolation(MO)	Open		
LPCS-V-707	RB-441	Upstream Isolation FE-2,FT-3,FIS-4	Open		
LPCS-V-708	RB-441	Downstream Isolation FE-2, FT-3, FIS-4	Open		
LPCS-V-709	RB-441	PS-5, PI-2 Isolation	Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE LPCS-3 (Cont'd)

DRAWING NO. M-520

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
LPCS-V-12	RB-441	Test Line Control Valve (MO)	Closed		
LPCS-V-60 @	RB-441	Test Line Isolation	Locked Open†		
LPCS-V-66	RB-501	Control Air Isolation for AO-6	Locked Closed		
LPCS-V-67	RB-501	Control Air Isolation for AO-6	Locked Closed		
LPCS-V-68	RB-501	Control Air Vent	Closed		
LPCS-V-X78b	RB-501	Containimment Instrument Iso. Detection D/P Iso.	Open		
LPCS-V-5	RB-522	Injection Line Control Valve (MO)	Closed		
LPCS-V-6	C132 DW-547	Injection Line Testable Check Valve (MO)	Closed		
LPCS-V-51 @	C123 DW-554	Injection Line Isolation Valve	Locked Open		
LPCS-V-78	RB-422	P-2 Min. Flow Line Isolation	Open		

@ Requires independent verification of valve position by licensee personnel.
† Throttled and locked to prevent pump run-out (run-our occurs at flows greater than 6400 gpm).

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SM-7	RW-467	LPCS-P-1 LPCS Pump E-CB-LPCS	Racked In		
MC-7B-CUB -6B	RB-522	LPCS-P-2 Water Leg Pump 6B	Closed		
MC-7B-A-CUB-2A	RB-522	LPCS-V-1 (MO) 2A	Closed		
MC-7B-A-CUB-2B	RB-522	LPCS-V-5 (MO) 2B	Closed		
MC-7B-A-CUB-4B	RB-522	LPCS-V-11 (MO) 4B	Closed		
MC-7B-A-CUB-2C	RB-522	LPCS-V-12 (MO) 2C	Closed		
DP-SI-1A #9	MCR	Control Logic Power (LPCS/RHR/RCIC)	Closed		
PP7AA #1	MCR	LPCS V-6 Power	Closed		
PP7AA #4	MCR	LPCS FT-3 Power	Closed		
PP7AE #29	RB-471	Controller/Indicator for LPCS V-6	Closed		
PP7AE #5	RB-471	LPCS P-1 Motor Space Heaters	Closed		

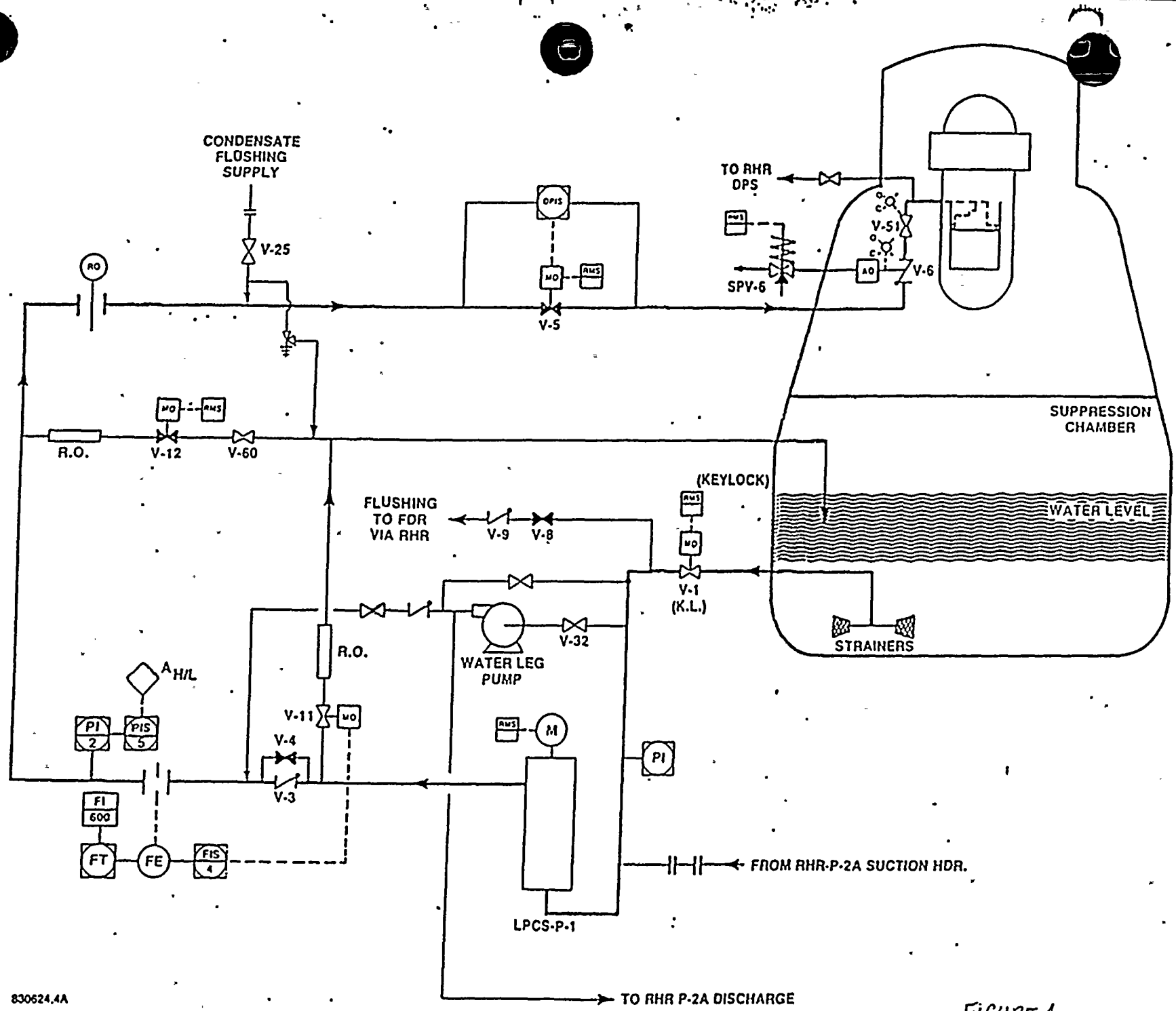

FIGURE 1
LPCS

FIGURE 1

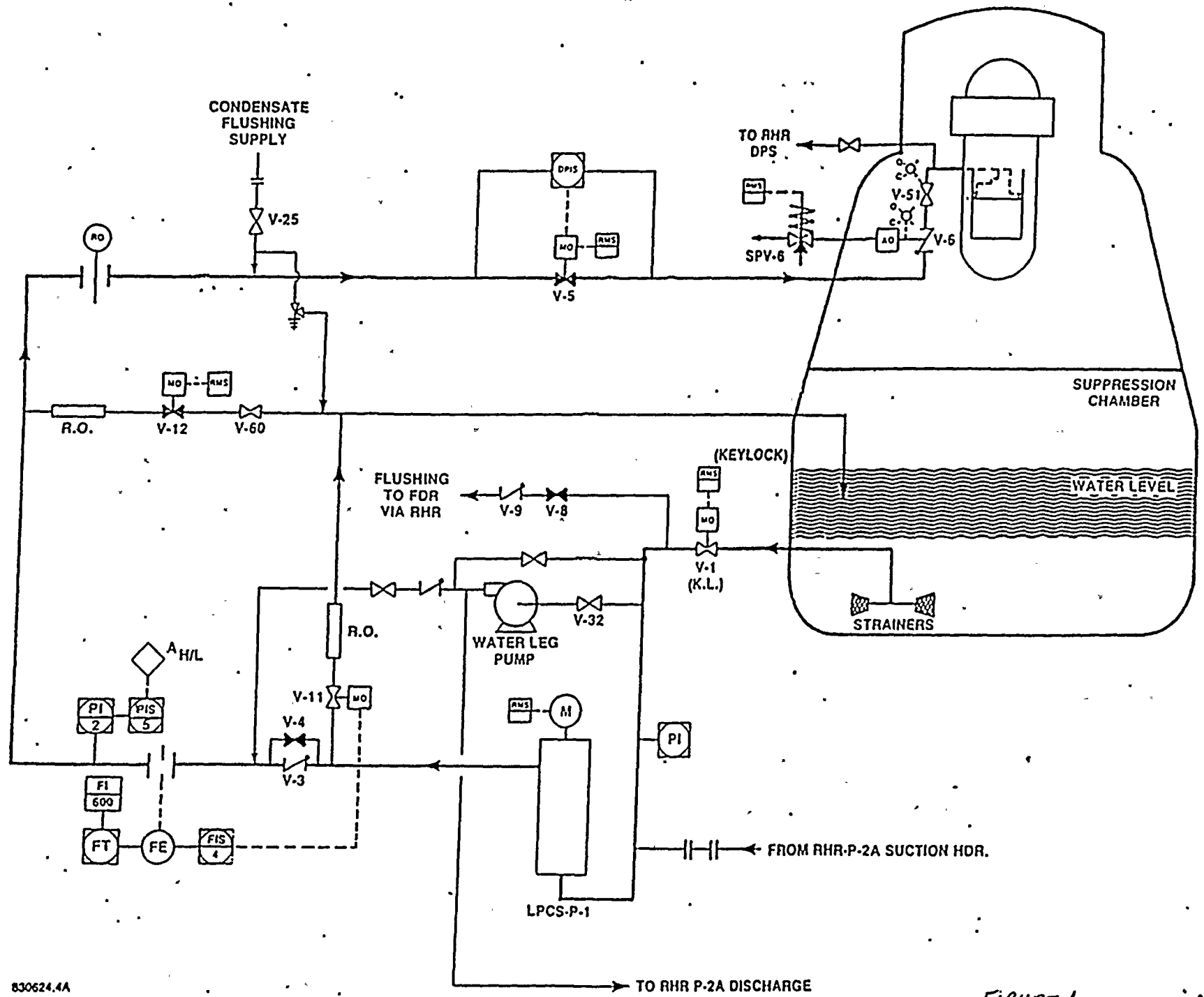

FIGURE 1
LPCS

FIGURE 1

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Main Steam Isolation Valves (MSIVs)

TABLE MSIV-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration and testing and/or preventive or unscheduled maintenance activities and procedures, and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
TS - Technical Specifications

Mission Success Criteria

There are two redundant MSIVs for each of the four main steam lines, for a total of 8 MSIVs. One set of valves, MS-V-22-A-D, are within the drywell and the others, MS-V-28 A-D, are located just outside the drywell, in the steam tunnel.

The safety objectives of the MSIV's are:

a) To prevent damage to the fuel barrier by limiting the loss of reactor coolant in the event of a major steam line break outside the primary containment. A high steam flow condition will cause an MSIV isolation.

b) By rapid isolation of MSIV's the release of radioactive materials to the environs will be limited. Should the fuel cladding fail, fission products will be released into the coolant. The steam produced will be highly radioactive. Radiation monitors placed close to each line will sense MSL radiation and when this signal represents three times normal background radiation, the MSIV's will be given the signal to isolate.

CONDITIONS THAT CAN LEAD TO FAILURE

c) In the event of a line break within the drywell, release of radioactive materials to the environs is curtailed, again by MSIV isolation. The signals which are used to indicate a line break are main steam line high flow and/or reactor low water level.

d) The valves must remain open or be re-opened if the turbine bypass valves are to be used to remove decay heat via the main condenser and the Condensate and Feedwater Systems. Failure of the operator to re-open the valves after closure is considered a system failure. Normal fast closure time for the MSIVs is 3 to 5 seconds.

Two AC powered, solenoid operated, pilot actuating valves route air to desired ports, thereby positioning the MSIV. The electrical supplies for the valves come from two separate sources, RPS buses A and B. Each MSIV has 2 pilot operating solenoids. One solenoid is powered from RPS bus A and one solenoid is powered from RPS bus B. A loss of both RPS buses is required to cause the valves to close. An accumulator, mounted on the MSIV, provides backup pneumatic pressure to close the valve when both solenoids are de-energized or pneumatic supply pressure to the valve operator fails.

The air supply for the outboard MSIVs is from the control air system. The inboard MSIVs are supplied from the containment instrument air/N_2 inerting system. The supply air/N_2, accumulator, or the spring pressure, is capable of isolating the valve independently with the reactor at full pressure. In the event of a failure in any two systems the third will close the valve, provided the under-the-piston area of the air cylinder is vented off.

The MSIVs will automatically close on any of the following signals:

a. Reactor low water level (-50", level 2)
b. Main steam line high radiation (3X normal)
c. Main steam line high steam flow (104 psig, 140% steam flow)
d. Main steam line low pressure (831 psig, with mode switch in run)
e. Main steam line tunnel high temperature or, high ventilation system differential temperature.
f. Main condenser low vacuum (7" Hg, may be bypassed by manual switch).

The MSIVs can also be manually closed by their associated control switches on P601 or by arming and depressing the four NS^4 pushbuttons on P601 (any combination of "A" or "C", and "B" or "D" pushbuttons).

TABLE MSIV-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

1. MSIVs Fail to Remain Open or Operator Fails to Re-Open Valves

During a transient the MSIVs may be spuriously closed or they may close automatically by the signals described above. The MSIVs must be open for the Power Conversion System to be used for heat removal from the reactor and the containment. If the MSIVs have closed and they are needed for a heat removal path, the operator must reopen them remote manually from the control room. (PC,PT,MT,OP)

2. MSIVs Fail to Close or Leak Excessively

If containment isolation is required, then the MSIVs must close and provide a leak tight seal. Failure to close can be caused by miscalibration of sensors or failure of logic circuitry. (PC,PT,MT)

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Feedwater, Condensate, and Power Conversion Systems (FW/CD/PCS)

TABLE PCS-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration, testing and/or preventive or unscheduled maintenance activities, procedures and training and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
IS - Inservice inspection activities, procedures and training.
TS - Technical specifications.

Mission Success Criteria

The Power Conversion System (PCS) consists of the Main Steam System, the Main Turbine Generator, the Turbine Bypass Valves (4 valves, 25% capacity), the Main Condenser, and the Circulating System. It functions to convert reactor power to electricity, or to merely reject heat to the ultimate heat sink via the turbine bypass valves, the condenser, and the circulating water system.

The feedwater and condensate systems transfer the condensate from the main condenser hotwells to the reactor feedwater pumps, pre-heat the feedwater and return it to the reactor pressure vessel to be converted to steam. These systems are not initiated automatically but are normally operating, non-safety systems which automatically control reactor level within a predetermined range.

Manual/automatic startup, operation and shutdown take place from the control room. Loss of offsite power automatically trips the main turbine, feedwater, and condensate systems. Automatic shutdown of the feedwater system also occurs upon isolation of the MSIVs or a FW turbine trip.

CONDITIONS THAT CAN LEAD TO FAILURE

There are two steam turbine-driven FM pumps, three condensate booster pumps, and three condensate pumps, all divided into two partially separated flowpaths A and B interspersed with the High and Low Pressure Heaters. At least one flow path containing one FW pump, one condensate booster pump, and one condensate pump is required to maintain reactor water level following a trip.

A. Feedwater System

1. Failure of Long Term Operator Actions to Control Feedwater During Cooldown (e.g., Failure to Provide Long-Term Makeup to the Condenser)

Operator actions are an essential aspect of long-term feedwater control during cooldown. Loss of feedwater can occur by such actions as failure to provide makeup to the condenser to maintain proper condenser level (OP).

2. Miscalibration of Sensors Causes False FW System Trip

Miscalibration of sensors such as high reactor water level can cause FW isolation due to a false high water level signal or failure of the FW pump turbines due to gross moisture carryover (PC,PT).

Miscalibration of the low reactor pressure sensors can cause FW pump trip due to a low turbine steam supply pressure, although condensate flow would continue (PC,PT).

Miscalibration of or false signals from the low condenser vacuum sensors, paths A and B, can also cause an automatic trip of the FW system on low condenser vacuum, although condensate flow would continue in this case as well (PC,PT).

3. Common Mode Failure of All Offsite Power Sources

Common mode failure of all offsite power sources causes an automatic trip of both the feedwater and condensate systems. Refer to Electric Power Distribution System Table EP-1, for specific inspection information.

4. FW System Trips Due to Failure in FW Control Logic, Failure of FW Turbine Control Causing Loss of H.P. Steam, Spurious MSIV Closure, or Genuine Isolation Signal Causing MSIV Closure

A FW system trip causes loss of the system. Such trips can be caused by several instrumentation and controls-related problems such as failure in the FW control or FW turbine control logic components or a spurious closure of the MSIVs. A genuine containment isolation signal also causes MSIV closure leading to FW trip. The former failures can be related to periodic calibration

CONDITIONS THAT CAN LEAD TO FAILURE

and testing activities while the latter is part of the normal system response to a containment isolation and, in fact, the inspection focus should be on ensuring this response (PC,PT).

5. Transient Condition Leads to FW Trip

Sudden, sharp variations in operating conditions such as reactor water level and other process variables can cause FW trip. Such transients can be caused by operator errors (OP).

6. Steam Jet Air Ejector Legs Unavailable and Mechanical Vacuum Pumps Unavailable Cause Loss of Condenser Vacuum

The loss of the capability of the steam jet air ejectors to maintain condenser vacuum combined with unavailability of the mechanical vacuum pumps will lead to a loss of condenser vacuum which in turn leads to loss of FW.

a) Steam Jet Air Ejectors (SJAE) Legs Unavailable

This can be caused by:

i) Loss of Main Air Ejectors (OP,MT)

ii) Test or Maintenance of SJAE (PT,MT)

iii) Off Gas System Failure/Trips (OP,MT)

b) Mechanical Vacuum Pump Unavailable

This can be caused by:

i) Operator Fails to Start Pump (OP)

ii) Pump Leg in Test or Maintenance (PT,MT)

iii) Pump Fails to Start and Run (OP,PT)

iv) Condenser Vacuum Limitation (OP)

v) Operational Limit Prohibits Pump Operation When Reactor Pressure >125 psig.

7. Feedwater Minimum Flow Control Valve RFW-FCV-15 or Start-up Flow Control Valve FCV-10 Fails to Remain Open

Failure of either of these valves can cause loss of FW flow under certain conditions. (OP,MT)

CONDITIONS THAT CAN LEAD TO FAILURE

B. Condensate System

1. Failure of Long Term Operator Actions to Control Condensate During Cooldown (e.g., Failure to Provide Long-Term Make-up to the Condenser)

Operator actions are an essential aspect of long-term condensate control during cooldown. Loss of condensate can occur by such actions as failure to provide make-up to the condenser to maintain proper condenser level (OP).

2. Common Mode Failure of All Offsite Power Sources

Common mode failure of all offsite power sources causes an automatic trip of both the feedwater and condensate systems. Refer to Emergency Electric Power System, Table A5-1, for specific inspection information.

3. Flow Control Instruments Fail to Supply Signal or Supply False Signal to Trains A, B and C

Failure of the flow control instruments to supply signals or by supplying false signals to the FW/CD flow control devices can cause a CD system trip (PC,PT).

4. Rupture of Piping or Heat Exchangers

Rupture of piping or of the various heat exchangers within the CD system can cause unavailability of the CD system (IS).

5. Condensate or Condensate Booster Pumps A, B and C Fail to Continue Running

Failure of either the Condensate Pump or Condensate Booster Pump (CBP) in Train A combined with failure of either pump in Trains B and C will cause loss of the CD system. Failure can also be caused by:

- CBP Minimum Flow Valves 15A, B or C failing to open. (OP,MT,TS)

6. Condensate Demineralizer System (CDS) Failure

Since the CDS processes all CD flow from both condensate pumps, any failure in the CDS can cause total loss of the CD system (OP,MT).

7. Rupture of Condenser Hotwell.

A rupture of the condenser hotwell tubes would allow contaminated circulating water to enter the CD system or cause loss of the hotwell inventory, thereby preventing CD system flow (IS,OP).

TABLE PCS-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

C. Power Conversion System (PCS)

1. Failure of Turbine Bypass Valves Mechanically or Electronically

The 4 Turbine Bypass Valves are automatically and sequentially controlled. Post-accident they must be used since the main turbine is not available. (OP,MT,PC)

2. Loss of Vacuum

Vacuum can be lost by a leak in the condenser or by loss of the circulating water system. (IS,OP,MT)

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Feedwater, Condensate, and Power Conversion Systems (FW/CD/PCS)

TABLE PCS-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS	FAILURE MODES
41700	Training	FW control system SJAE, Mech. vacuum pumps, offgas system condensate & booster pumps, CD demineralizer system, condenser.	A:1, 5,6
52051	Instrument Components and Systems-Procedure Review	Reactor High level, Reactor low pressure, Condenser low vacuum sensors, FW control logic	A:2,4 B:3 C:1
52053	Instrument Components and Systems-Work Observation		
52055	Instrument Components and Systems-Record Review		
56700	Calibration		
61725	Surveillance and Calibration Program	FW control system FW turbine control, Isolation signal SJAE, Mech. Vacuum pumps, CD flow control system, heat exchangers, Piping, Condenser Hotwell.	A:2,4,6 C:1
61726	Monthly Surveillance Observation		
72700	Startup Testing-Refueling		

TABLE PCS-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION (Cont'd)

PROCEDURE NUMBER	TITLE	COMPONENTS	FAILURE MODES
71707	Operational Safety Verification	SJAE, Mech. Vacuum Pump, CD flow control instruments, condensate & booster pumps, CD Demineralizer System.	A:6 B:5,6,8 C:1,2
71710	ESF System Walkdown		
62702	Maintenance (Refueling)		
62703	Monthly Maintenance Observation		

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Feedwater, Condensate, and Power Conversion Systems (FW/CD/PCS)

TABLE PCS-3 MODIFIED SYSTEM WALKDOWN LIST

A. Feedwater System

Since the large majority of system failure modes involves operator errors, false instrument signals, control logic failures or miscalibration of sensors, a system walkdown will reveal little tangible information. However, the probability of failures leading to loss of condenser vacuum through failures of the steam jet air ejectors and the mechanical vacuum pump can be reduced by system walkdown for those components described in the next section for the Condensate System. (Loss of condenser vacuum causes loss of the Feedwater System but not the Condensate System.)

B. Condensate System

The failure modes for the Condensate System consist, for the most part, of operator errors, failure of the flow control instruments, loss of off-site power, failure of the Condensate and Booster Pumps to continue running, etc. Again, a system walkdown will yield very little tangible information with the exception of the following:

C. Power Conversion System (PCS)

The main failure mode of the PCS is failure of the turbine bypass valves either mechanically or electrically. MSIVs are covered in MSIV-1 to 3.

1. For FW System Failure Caused by Loss of Condenser Vacuum

Description	I.D. No.	Location	Desired Position	Actual Position
a. Gland Steam Cond. Bypass (7 PSID)	COND-PCV-5	CRBd A	Auto	
b. SJAE Bypass (7 PSID)	COND-PCV-7	Same	Auto	
c. Ejector Cond A Inlet	COND-V-114A	Same	Open	
d. Ejector Cond A Outlet	COND-V-111A	Same	Open	
e. Ejector Cond B Inlet	COND-V-114B	Same	Open	
f. Ejector Cond B Outlet	COND-V-111B	Same	Open	

TABLE PCS-3 (Cont'd)

1. Condensate (Cont'd)

Description	I.D. No.	Location	Desired Condition	Actual Condition
g. Mechanical Vacuum Pumps (Should be off during power operation.)			Status	
h. Offgas System		Radwaste Bldg.	Status	

2. Condensate Demineralizer System

3. Walkdown of High Rupture Risk Components

Description	I.D. No.	Location	Desired Condition	Actual Condition
a. Piping			Status	
b. Heat Exchangers			Status	
c. Condenser Hot Well			Status	

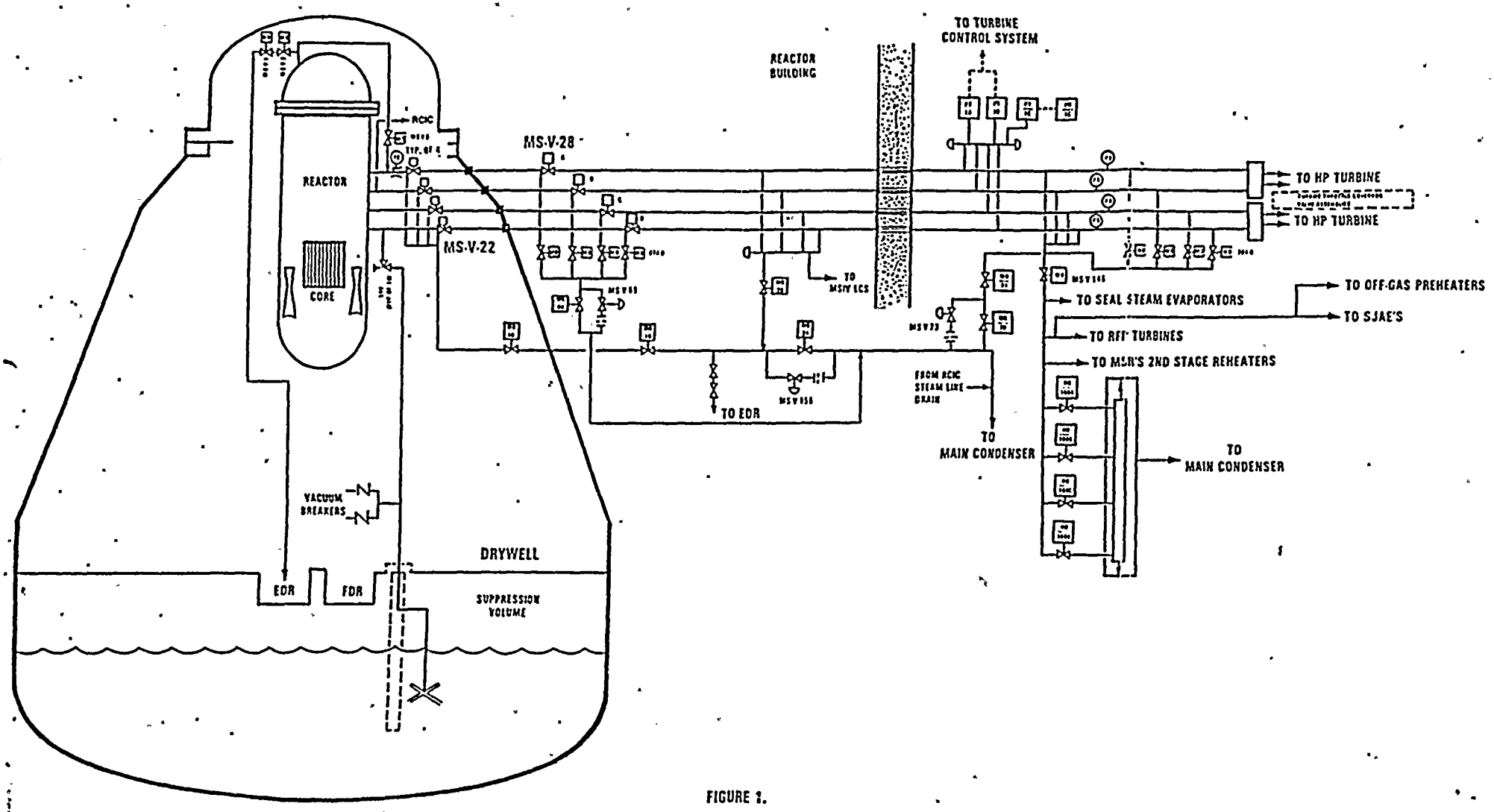

FIGURE 1.

MAIN STEAM SYSTEM

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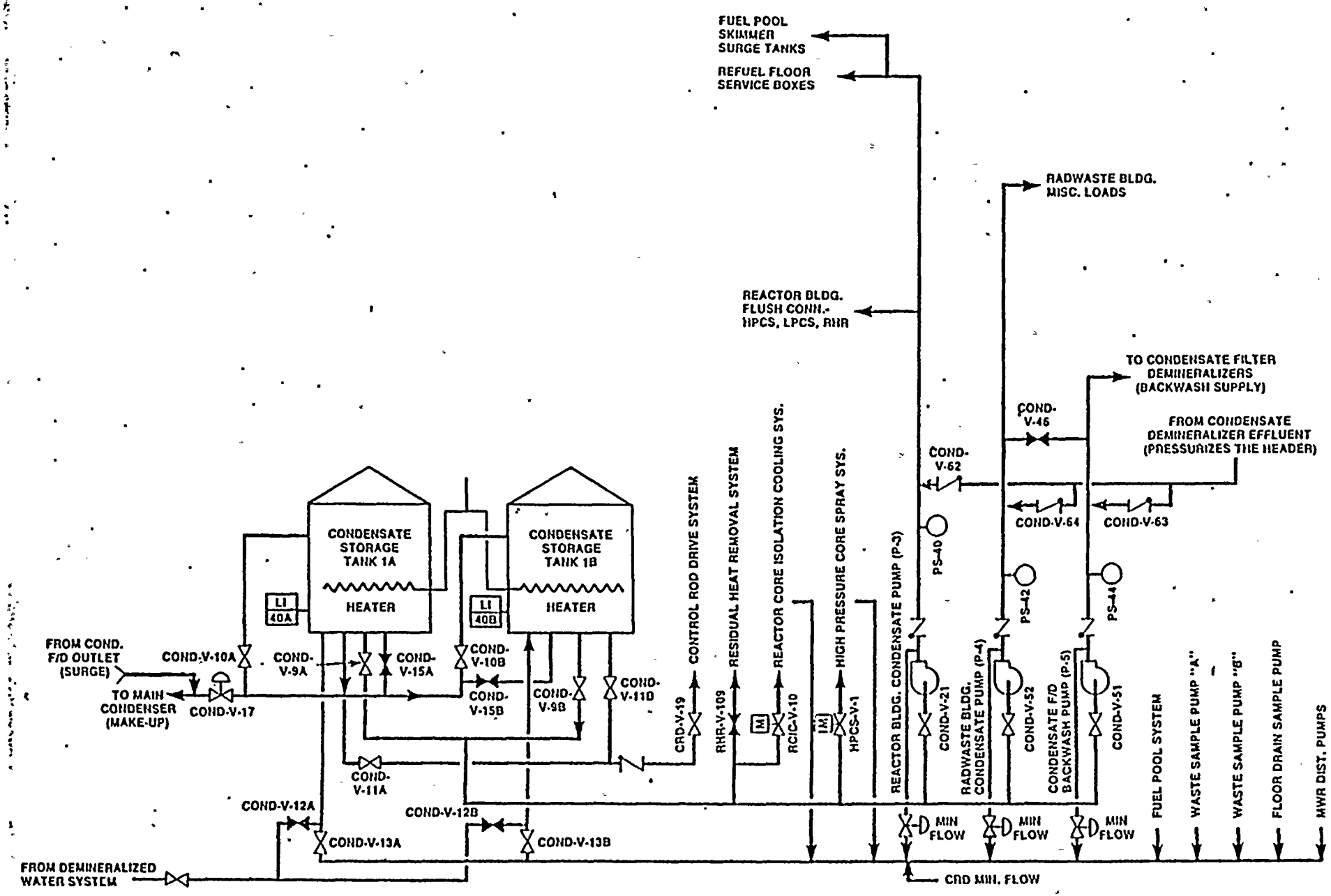

FIGURE 1. CONDENSATE STORAGE AND SUPPLY SYSTEM

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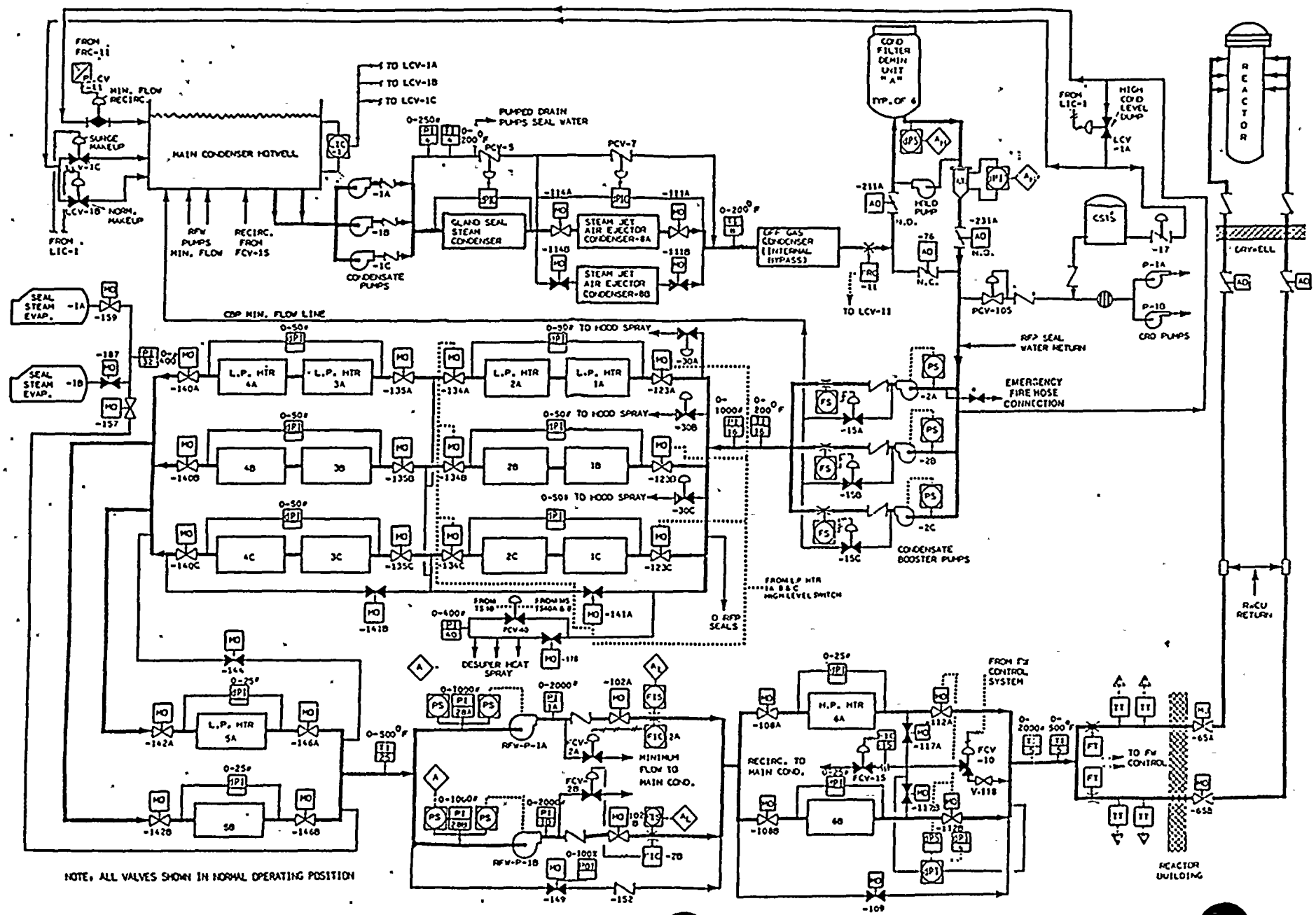


FIGURE 1. CONDENSATE AND FEEDWATER FLOWPATH

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Standby Gas Treatment System

TABLE SGT-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration and testing and/or preventive or unscheduled maintenance activities and procedures, and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.

System Description
Mission Success Criteria

The SGT has two 100% capacity trains of filters and each train has two 100% capacity fans whose primary purpose is to prevent exfiltration from the Reactor Building by maintaining the secondary containment at 0.25 inches water gauge vacuum, and by exhausting air through the filter trains. The secondary function is to filter the purge exhaust of the Primary Containment when radiation levels in the PC preclude direct exhaust.

1. The most likely mode of failure is one train out of service for maintenance and failure of the redundant train. (PT,MT)

Note: The remaining failure modes focus on events that cause the unavailability of one train.

2. Fire in charcoal beds of train A(B) caused by inadequate/uneven air flow, or loss of both fans FN 1A-1/1A-2 (1B-1, 1B-2), or operator error in removing a train from service. (PT,MT,OP)

3. Failure to provide adequate air flow through train A(B) caused by the following. (PC,PT,MT)

   1) Failure of FN1A-1 (1B-1) to start or run and FN1A-2 (1B-2) fails to auto start due to mechanical/instrumentation problems.

Failure of fan automatic vortex damper due to mechanical problems and a failure or miscalibration of secondary containment pressure control system.

3) Any of the following values fail to go to indicated position following a FA2 signal:

SGT-V-1A(1B) PC Purge	Close
SGT-V-2A(2B) RB Intake	Open
SGT-3A1,3A2(3B1,3B2) SGT Inlet	Open
SFT-V-4A1,4A2(4B1,4B2) SGT Outlet to RB	Close
SGT-V-5A1(5B2) SGT Outlet to Outside	Open
SGT-V-5A2(51) SGT Outlet to Outside	Close

4. Failure to maintain vacuum in secondary containment due to: (PT,MT)

1) Air infiltration > 2240 CFM
2) SGT V-1A(1B) fail open
3) Failure of SGT trains A and B as described in failure modes 1-4.

Note: To assure Reactor Building integrity, it is suggested that the licensee's periodic negative pressure test at -0.25in. W.C. be witnessed or otherwise verified.

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Standby Gas Treatment System (SGTS)

TABLE SGT-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS	FAILURE MODES
56700	Calibration	FA2 signal initiators	3,4,
62702	Maintenance (Refueling)	Valves, Fans, Dampers, Charcoal Beds	1-4
52051	Instrument Components and Systems-Procedure Review	Sensors, Switches, Control Circuitry	3
52053	Instrument Components and Systems-Work Observation	Sensors, Switches, Control Circuits	3
52055	Instrument Components and Systems-Record Review	Sensors, Switches, Control Circuits	3
61725	Surveillance & Calibration Control Program	Control Circuitry	3
61726	Monthly Surveillance Observation		
71707	Operational Safety Verification	Valves, Fans, Dampers Charcoal Beds	1-4
71710	ESF System Walkdown		
41700	Training	Valves, Fans, Dampers, Charcoal Beds	2
41701	Requalification Training		

WASHINGTON NUCLEAR PLANT NO. 1
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Standby Gas Treatment

TABLE SGT-3 MODIFIED SYSTEM WALKDOWN

DRAWING NO: M-544

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
FP-V-72	R-572	Carbon Filter 1A-1 Deluge Isolation	Locked/ Open		NE Control Against Wall
SGT-V-702A	R-572	SGT-PI-6A-1 Root	Open		NE Control Against Wall
CAS-V-178	R-572	Air Supply to SGT-V-F26 Operator	Open		NE Control Against Wall
SGT-V-F21	R-572	SGT-PCV-F26 Inlet Iso	Open		NE Control Against Wall
SGT-V-F24	R-572	SGT-PI-6A-2 Root	Open		NE Control Against Wall
FP-V-71	R-572	Prefilter 1A Deluge Isolation	Locked/ Open		NE Control Against Wall
SGT-V-701A	R-572	SGT-PI-8A-1 Root	Open		NE Control Against Wall
SGT-V-F14	R-572	SGT-PI-8A-2 Root	Open		NE Control Against Wall
SGT-V-F11	R-572	SGT-V-F16 Inlet Iso	Locked/ Open		NE Control Against Wall
CAS-V-177	R-572	Air Supply to SGT-V-F16 Operator	Open		NE Control Against Wall
FP-V-73	R-572	Carbon Filter 1A Deluge Isolation	Locked/		NE Control Against Wall
SGT-V-703A	R-572	SGT-PI-7A-1 Root	Open		NE Control Against Wall

TABLE SGT-3 (Cont'd)

DRAWING NO: M-544

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SGT-V-F34	R-572	SGT-PI-7A-2 Root	Open		NE Control Against Wall
SGT-V-F31	R-572	SGT-V-F36 Inlet Iso	Locked/ Open		NE Control Against Wall
CAS-V-100-5	R-572	Air Supply to SGT Iso	Open		NE Control Against Wall
CAS-V-179	R-572	Air Supply to SGT-V-F36 Operator	Open		NE Control Against Wall
FP-V-74	R-572	Pressure 1B Deluge Isolation	Locked/ Open		NE Control Against Wall
SGT-V-701B	R-572	SGT-PI-8B-1-Root	Open		NE Control Against Wall
SGT-V-F44	R-572	SGT-PI-8B-2 Root	Open		NE Control Against Wall
SGT-V-F41	R-572	SGT-V-F46 Inlet Iso	Locked/ Open		NE Control Against Wall
CAS-V-180	R-572	Air Supply to SGT-V-F46 Operator	Open		NE Control Against Wall
SGT-V-F42	R-572	SGT-V-F46 Inlet Ret.	Closed		NE Control Against Wall
FP-V-76	R-572	Carbon Filter 1B-2 Deluge Isolation	Locked/ Open		NE Control Against Wall
SGT-V-703B	R-572	SGT-PI-7B-1 Root	Open		NE Control Against Wall

TABLE SGT-3 (Cont'd)

DRAWING NO: M-544

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SGT-V-F64	R-572	SGT-PI-7B-1 Root	Open		NE Control Against Wall
SGT-V-F61	R-572	SGT-V-F66 Inlet Iso	Locked/ Open		NE Control Against Wall
SGT-V-F63	R-572	SGT-V-F66 Outlet Iso	Closed		NE Control Against Wall
CAS-V-182	R-572	Air Supply to SGT-V-66 Operator	Open		NE Control Against Wall
FP-V-75	R-572	Carbon Filter 1B-1 Deluge Isolation	Locked/		NE Control Against Wall
SGT-V-702B	R-572	SGT-PI-6B-1 Root	Open		NE Control Against Wall
SGT-V-54	R-572	SGT-PI-6B-2 Root	Open		NE Control Against Wall
SGT-V-F51	R-572	SGT-V-F56 Inlet Isolation	Locked/ Open		NE Control Against Wall
SGT-V-F53	R-572	SGT-V-F56 Outlet Drain	Closed		NE Control Against Wall
CAS-V-181	R-572	Air Supply to SGT-V-F56 Operator	Open		NE Control Against Wall
SGT-V-710A	R-572	SGT-DPIS-4A Root (Carbon Filter)	Open		On SGT-Train A
SGT-V-711A	R-572	SGT-DPIS-4A Test	Closed		On SGT-Train A

TABLE SGT-3 (Cont'd)

DRAWING NO: M-544

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SGT-V-720	R-572	SGT-FT-1B-1 Root (Fan Discharge)	Open		On SGT-Train A
SGT-V-721	R-572	SGT-FT-1B-2 Root	Open		On SGT-Train A
SGT-V-722	R-572	SGT-FT-1B-2 Root (Fan Discharge)	Open		On SGT-Train A
SGT-V-723	R-572	SGT-FT-1B-2 Root	Open		On SGT-Train A
SGT-V-727	R-572	SGT-FT-2B Root (Train Discharge to Stack)	Closed		On SGT-Train A
SGT-V-728	R-572	SGT-FIS-2A2 Root	Open		
SGT-V-729	R-572	SGT-FIS-2B1 Root	Open		

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-7B-B	R-572 Col M6	SGT-FN-1A-1 BKR 2C	Closed		
MC-7B-B	R-572 Col M6	SGT-FN-1B-1 BKR 2D	Closed		
MC-7B-B	R-572 Col M6	SGT-V-1A BKR 3A	Closed		
MC-7B-B	R-572 Col M6	SGT-V-3A-1 BKR 3B	Closed		
MC-7B-B	R-572 Col M6	SGT-V-3B-1 BKR 3C	Closed		

TABLE SGT-3 (Cont'd)

DRAWING NO: M-544

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SGT-V-720	R-572	SGT-FT-1B-1 Root (Fan Discharge)	Open		On SGT-Train A
SGT-V-721	R-572	SGT-FT-1B-2 Root	Open		On SGT-Train A
SGT-V-722	R-572	SGT-FT-1B-2 Root (Fan Discharge)	Open		On SGT-Train A
SGT-V-723	R-572	SGT-FT-1B-2 Root	Open		On SGT-Train A
SGT-V-727	R-572	SGT-FT-2B Root (Train Discharge to Stack)	Closed		On SGT-Train A
SGT-V-728	R-572	SGT-FIS-2A2 Root	Open		
SGT-V-729	R-572	SGT-FIS-2B1 Root	Open		

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-7B-B	R-572 Col M6	SGT-FN-1A-1 BKR 2C	Closed		
MC-7B-B	R-572 Col M6	SGT-FN-1B-1 BKR 2D	Closed		
MC-7B-B	R-572 Col M6	SGT-V-1A BKR 3A	Closed		
MC-7B-B	R-572 Col M6	SGT-V-3A-1 BKR 3B	Closed		
MC-7B-B	R-572 Col M6	SGT-V-3B-1 BKR 3C	Closed		

TABLE SGT-3 (Cont'd)

DRAWING NO: M-544

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION		REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-7B-B	R-572 Col M6	SGT-V-4A-1	BKR 3D	Closed		
MC-7B-B	R-572 Col M6	SGT-V-4B-1	BKR 4A	Closed		
MC-7B-B	R-572 Col M6	SGT-V-5A-1	BKR 4B	Closed		
MC-7B-B	R-572 Col M6	SGT-V-5B-1	BKR 4C	Closed		
MC-8B-B	R-572 Col N8	SGT-FN-1B-2	BKR 1F	Closed		
MC-8B-B	R-572 Col N8	SGT-FN-1A-2	BKR 2B	Closed		
MC-8B-B	R-572 Col N8	SGT-V-1B	BKR 3A	Closed		
MC-8B-B	R-572 Col N8	SGT-V-3A-2	BKR 3B	Closed		
MC-8B-B	R-572 Col N8	SGT-V-3B-2	BKR 3C	Closed		
MC-8B-B	R-572 Col N8	SGT-V-4A-2	BKR 3D	Closed		
MC-8B-B	R-572 Col N8	SGT-V-5A-2	BKR 4A	Closed		
MC-8B-B	R-572 Col N8	SGT-V-4B-2	BKR 4B	Closed		
MC-8B-B	R-572 Col N8	SGT-V-5B-2	BKR 4C	Closed		
MC-8B-B	R-572 Col N4	SGT-ESH-1B	BKR 2BL	Closed		

TABLE SGT-3 (Cont'd)

DRAWING NO: M-544

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-8B	R-572 Col N4	SGT-ESH-2B BKR 2BR	Closed		
MC-7B	R-572 Col N4	SGT-ESH-1A BKR 1BL	Closed		
MC-7B	R-572 Col N4	SGT-ESH-2A BKR 1BL	Closed		
PP-7A-E	R-471	SGT-FN-1A-1 Heater CKT 17	Closed		
PP-8A-E	R-471	SGT-FN-1A-2 Heater CKT 15	Closed		
PP-7A-E	R-471	SGT-FN-1B-1 Heater CKT 18	Closed		
PP-8A-E	R-471	SGT-FN-1B-2 Heater CKT 16	Closed		
PP-7A-E	R-471	SGT-ESH-1A Control CKT 7	Closed		
PP-8A-E	R-471	SGT-ESH-1B Control CKT 5	Closed		
PP-7A-E	R-471	SGT-ESH-2A Control CKT 8	Closed		
PP-8A-E	R-471	SGT-ESH-2B Control CKT 6	Closed		
PP-7A-E	R-471	SGT-V-2A CKT 4	Closed		
PP-8A-E	R-471	SGT-V-2B CKT 3	Closed		
PP-7A-E	R-471	Pressure Gauges on SGT-FU-1A CKT 1	Closed		

TABLE SGT-3 (Cont'd)

DRAWING NO: M-544

B. SYSTEM POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
PP-7A-E	R-471	Humidity Transmitter on SGT-FU-1A CKT 6	Closed		
PP-7A-E	R-471	Heat Detector Water Spray SGT-FU-1A CKT 9	Closed		
PP-8A-E	R-471	Pressure Gauges on SGT-FU-1B CKT 1	Closed		
PP-8A-E	R-471	Humidity Transmitter on SGT-FU-1B CKT 4	Closed		
PP-8A-E	R-471	Heat Detector Water Spray SGT-FU-1B CKT 7	Closed		

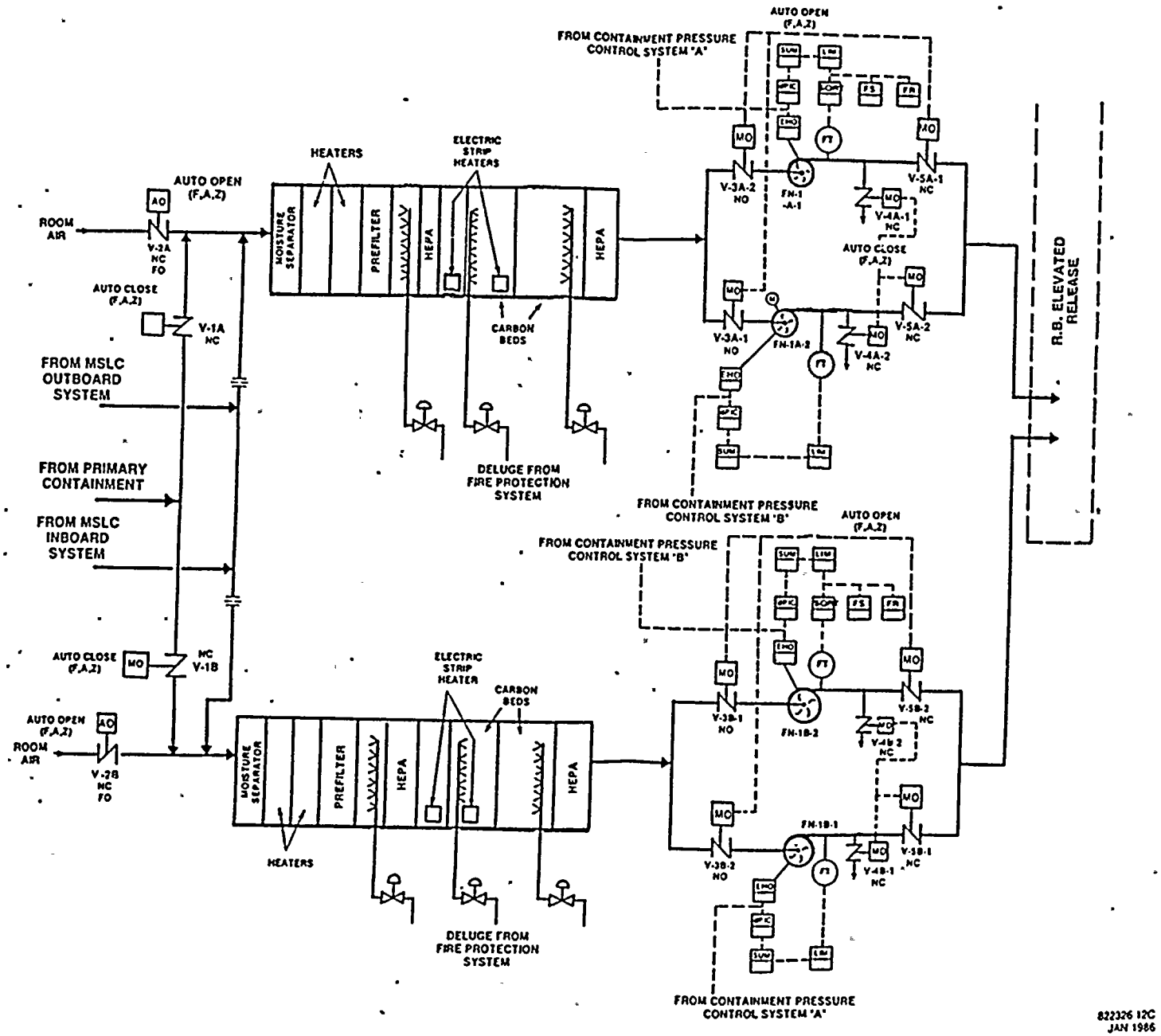


FIGURE 3. STANDBY GAS TREATMENT SYSTEM

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Main Steam Isolation Valves (MSIVs)

TABLE MSIV-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration and testing and/or preventive or unscheduled maintenance activities and procedures, and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
TS - Technical Specifications

Mission Success Criteria

There are two redundant MSIVs for each of the four main steam lines, for a total of 8 MSIVs. One set of valves, MS-V-22-A-D, are within the drywell and the others, MS-V-28 A-D, are located just outside the drywell, in the steam tunnel.

The safety objectives of the MSIV's are:

a) To prevent damage to the fuel barrier by limiting the loss of reactor coolant in the event of a major steam line break outside the primary containment. A high steam flow condition will cause an MSIV isolation.

b) By rapid isolation of MSIV's the release of radioactive materials to the environs will be limited. Should the fuel cladding fail, fission products will be released into the coolant. The steam produced will be highly radioactive. Radiation monitors placed close to each line will sense MSL radiation and when this signal represents three times normal background radiation, the MSIV's will be given the signal to isolate.

CONDITIONS THAT CAN LEAD TO FAILURE

c) In the event of a line break within the drywell, release of radioactive materials to the environs is curtailed, again by MSIV isolation. The signals which are used to indicate a line break are main steam line high flow and/or reactor low water level.

d) The valves must remain open or be re-opened if the turbine bypass valves are to be used to remove decay heat via the main condenser and the Condensate and Feedwater Systems. Failure of the operator to re-open the valves after closure is considered a system failure. Normal fast closure time for the MSIVs is 3 to 5 seconds.

Two AC powered, solenoid operated, pilot actuating valves route air to desired ports, thereby positioning the MSIV. The electrical supplies for the valves come from two separate sources, RPS buses A and B. Each MSIV has 2 pilot operating solenoids. One solenoid is powered from RPS bus A and one solenoid is powered from RPS bus B. A loss of both RPS buses is required to cause the valves to close. An accumulator, mounted on the MSIV, provides backup pneumatic pressure to close the valve when both solenoids are de-energized or pneumatic supply pressure to the valve operator fails.

The air supply for the outboard MSIVs is from the control air system. The inboard MSIVs are supplied from the containment instrument air/N_2 inerting system. The supply air/N_2, accumulator, or the spring pressure, is capable of isolating the valve independently with the reactor at full pressure. In the event of a failure in any two systems the third will close the valve, provided the under-the-piston area of the air cylinder is vented off.

The MSIVs will automatically close on any of the following signals:

a. Reactor low water level (-50", level 2)
b. Main steam line high radiation (3X normal)
c. Main steam line high steam flow (104 psig, 140% steam flow)
d. Main steam line low pressure (831 psig, with mode switch in run)
e. Main steam line tunnel high temperature or, high ventilation system differential temperature.
f. Main condenser low vacuum (7" Hg, may be bypassed by manual switch).

The MSIVs can also be manually closed by their associated control switches on P601 or by arming and depressing the four NS^4 pushbuttons on P601 (any combination of "A" or "C", and "B" or "D" pushbuttons).

TABLE MSIV-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

1. MSIVs Fail to Remain Open or Operator Fails to Re-Open Valves

During a transient the MSIVs may be spuriously closed or they may close automatically by the signals described above. The MSIVs must be open for the Power Conversion System to be used for heat removal from the reactor and the containment. If the MSIVs have closed and they are needed for a heat removal path, the operator must reopen them remote manually from the control room. (PC,PT,MT,OP)

2. MSIVs Fail to Close or Leak Excessively

If containment isolation is required, then the MSIVs must close and provide a leak tight seal. Failure to close can be caused by miscalibration of sensors or failure of logic circuitry. (PC,PT,MT)

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Main Steam Isolation Valves (MSIVs)

TABLE MSIV-2 INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS	FAILURE MODES
41700	Training	MSIVs	1
52051	Instrument Components and Systems - Procedure Review	Reactor Low Level, MS line high rad high steam flow, low pressure, MS tunnel high temp. or high ΔT.	
52053	Instrument Components and Systems - Work Observation		
52055	Instrument Components and Systems - Record Review		
61725	Surveillance and Calibration Control Program	MSIVs Logic functions described above	2
61726	Monthly Surveillance Observation		
61720	Containment Local Leak rate Testing		
62702	Maintenance	MSIVs	1,2
62703	Monthly Maintenance Observation		

WASHINGTON NUCLEAR PLANT NO.2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Main Steam Isolation Valves (MSIVs)

TABLE MSIV-3 MODIFIED SYSTEM WALKDOWN

DRAWING NO: M-502,M506,M529,M557

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MS-V-22A (AO) @	P601	"A" Inboard MSIV	Auto/ Open		
MS-V-22B (AO) @	P601	"B" Inboard MSIV	Auto/ Open		
MS-V-22C (AO) @	P601	"C" Inboard MSIV	Auto/ Open		
MSIV-22D (AO) @	P602	"D" Inboard MSIV	Auto/ Open		
MSIV-28A (AO) @	P602	"A" Outboard MSIV	Auto/ Open		
MSIV-28B (AO) @	P602	"B" Outboard MSIV	Auto/ Open		
MSIV-28C (AO) @	P602	"C" Outboard MSIV	Auto/ Open		
MSIV-28D (AO) @	P602	"D" Outboard MSIV	Auto/ Open		
MS-V-705A @	Htr Bay T-471	MS-PT-1A Root Iso Valve	Open		Top of Stm Ln Above MS-V-146
MS-V-705B @	Htr Bay T-471	MS-PT-1B Root Iso Valve	Open		Top of Stm Ln Above MS-V-146
MS-V-705C @	Htr Bay T-471	MS-PT-1C Root Iso Valve	Open		Top of Stm Ln Above MS-V-146
MS-V-705D @	Htr Bay T-471	MS-PT-1D Root Iso Valve	Open		Gage removed

TABLE MSIV-3 (Cont'd)

DRAWING NO: M-502,M506,M529,M557

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MS-V-706A @	Htr Bay T-471	Stm Line "A" to Ave. Manifold Iso Valve	Open		Top of Stm Ln Above MS-V-146
MS-V-706B @	Htr Bay T-471	Stm Line "B" to Ave. Manifold Iso Valve	Open		Top of Stm Ln Above MS-V-146
MS-V-706C @	Htr Bay T-471	Stm Line "C" to Ave. Manifold Iso Valve	Open		Top of Stm Ln Above MS-V-146
MS-V-706D @	Htr Bay T-471	Stm Line "D" to Ave. Manifold Iso Valve	Open		Top of Stm Ln Above MS-V-146
MS-V-708A @	Htr Bay T-471	MS-DPIS-13A Root Iso Manifold Iso Valve	Open		By Bypass Valves
MS-V-709A @	Htr Bay T-471	MS-DPIS-13A Root Iso Manifold Iso Valve	Open		By Bypass Valves
MS-V-709B @	Htr Bay T-471	MS-DPIS-13B Root Iso Manifold Iso Valve	Open		By Bypass Valves
MS-V-709C @	Htr Bay T-471	MS-DPIS-13C Root Iso Manifold Iso Valve	Open		By Bypass Valves
MS-V-709D @	Htr Bay T-471	MS-DPIS-13D Root Iso Manifold Iso Valve	Open		By Bypass Valves
MS-V-707A @	T-471	MS-PS-15A Root Iso Valve	Open		Under HP Turbine
MS-V-707B @	T-471	MS-PS-15B Root Iso Valve	Open		Under HP Turbine
MS-V-707C @	T-471	MS-PS-15C Root Iso Valve	Open		Under HP Turbine
MS-V-707D @	T-471	MS-PS-15D Root Iso Valve	Open		Under HP Turbine

@ Requires independent verification of valve position by licensee personnel.

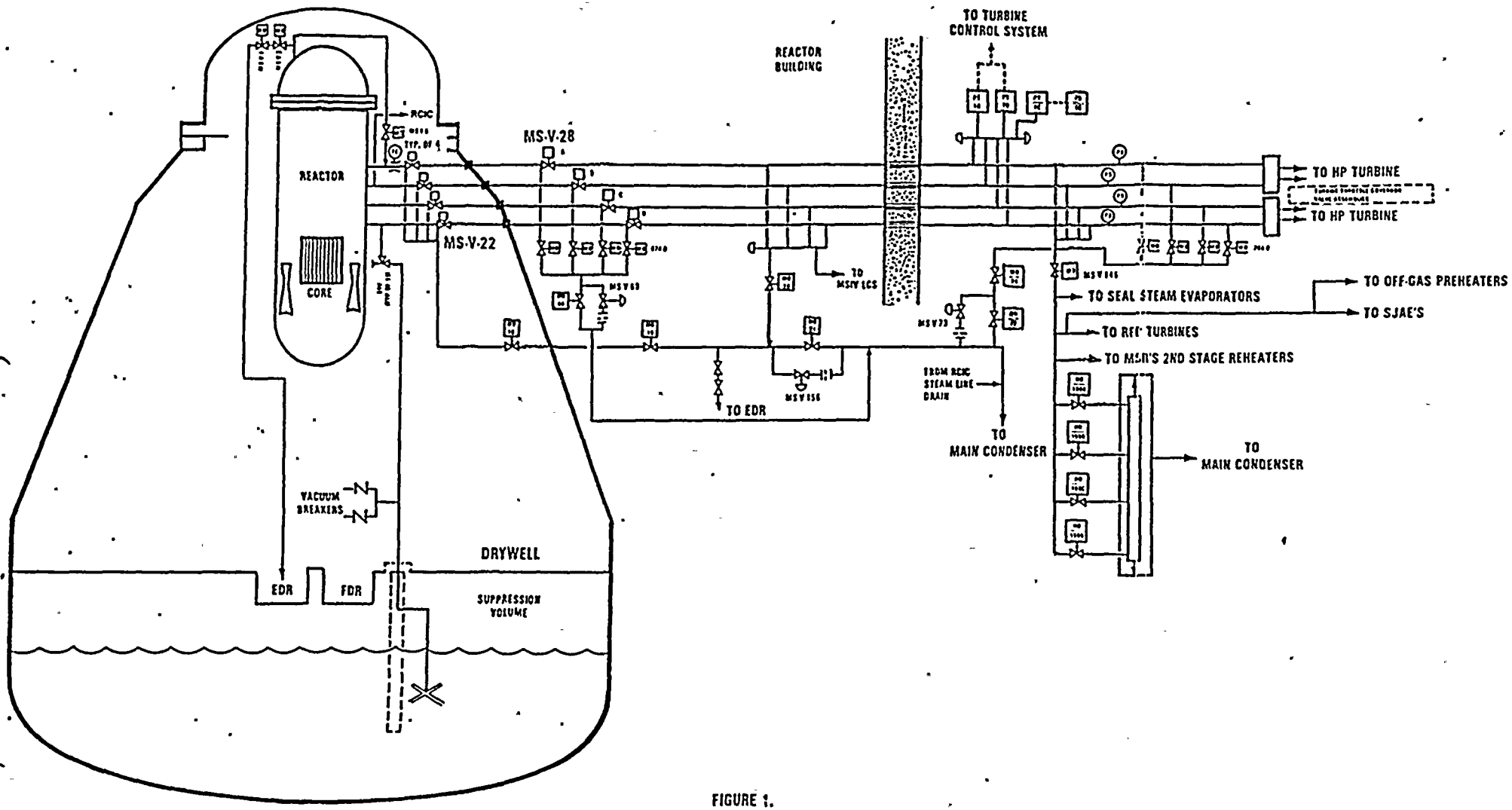
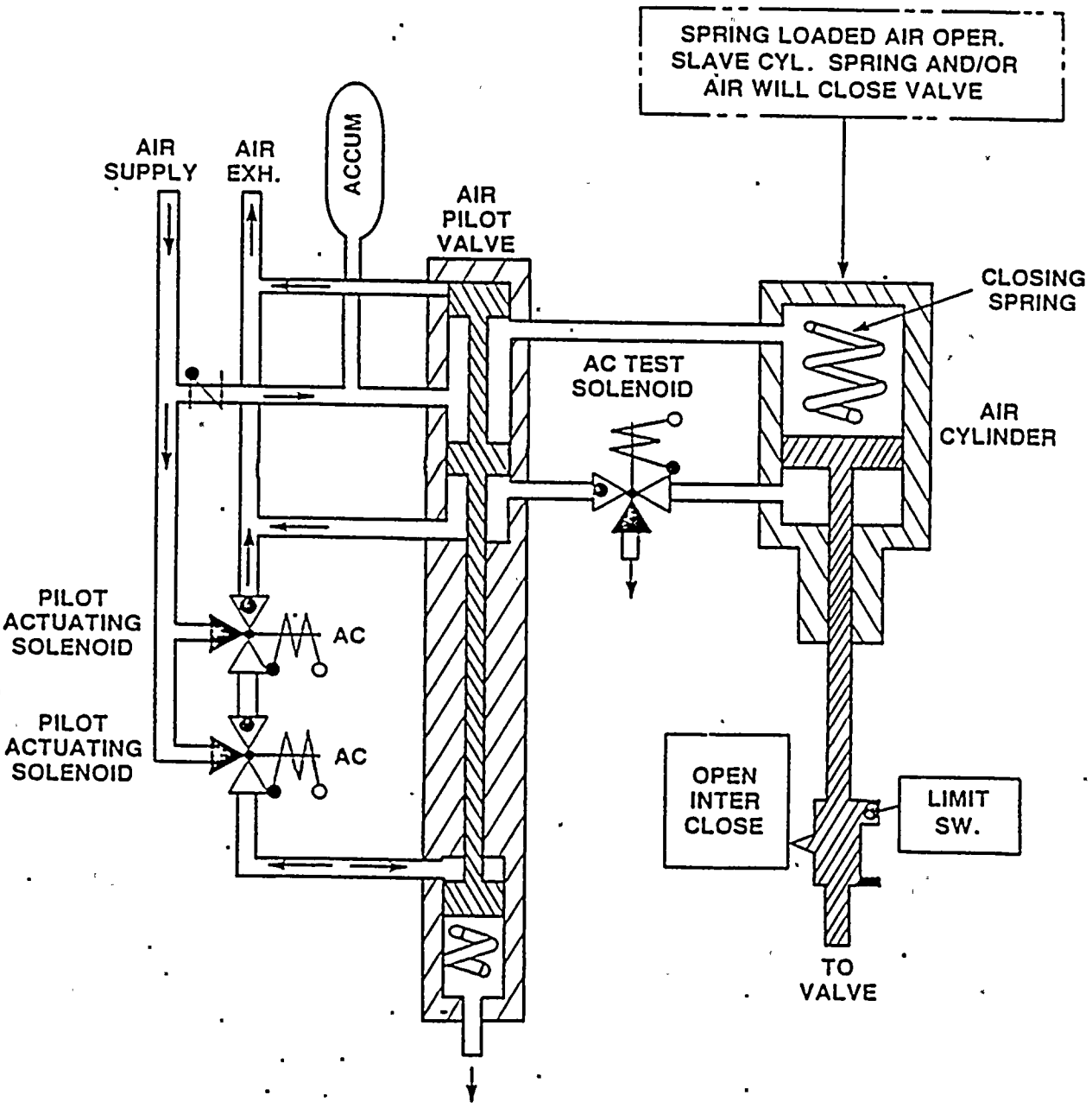


FIGURE 1.

MAIN STEAM SYSTEM

830624 3A
JULY 1985



MAIN STEAM LINE VLV. CONT. DIAG.
TYPICAL OF 8 VALVES

FIGURE 8B

841128.1A
MAY 1985

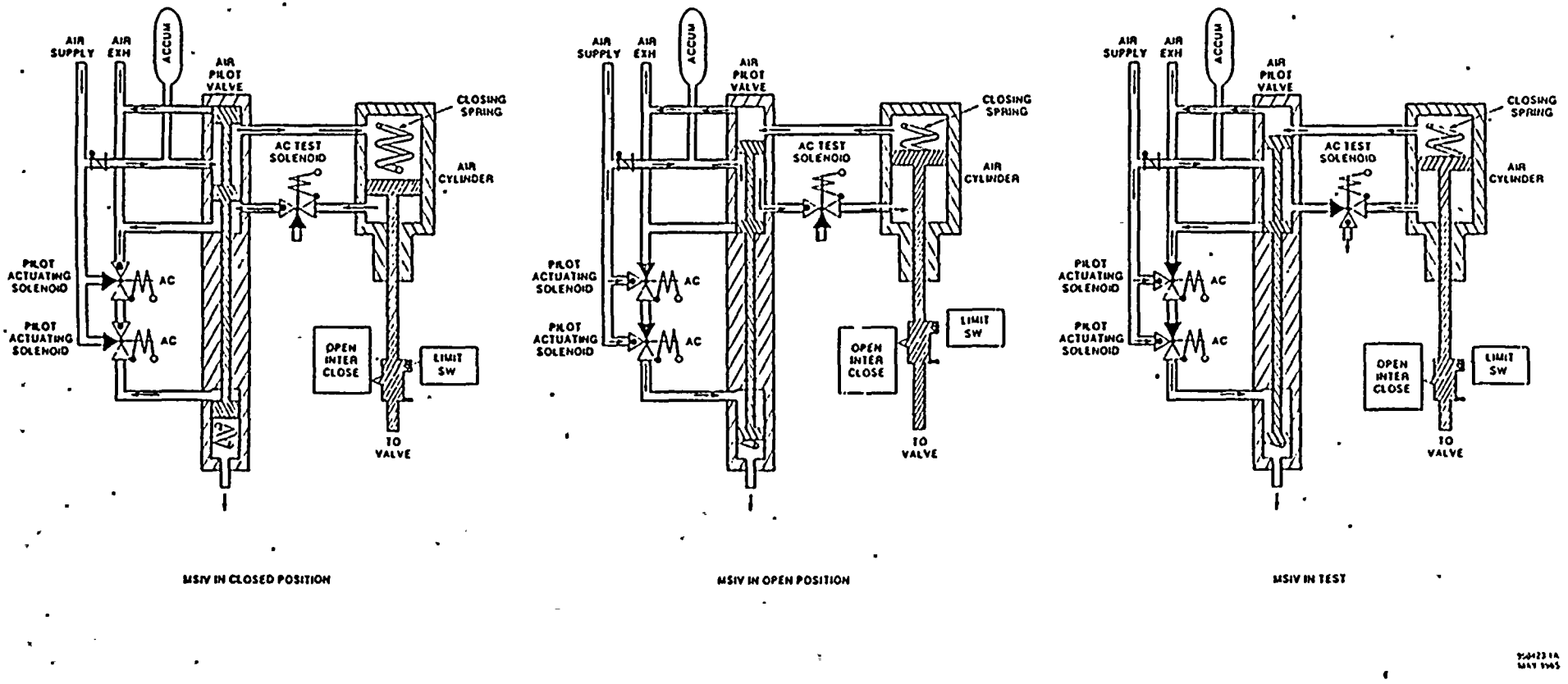


FIGURE 8. MSIV POSITION CONTROL

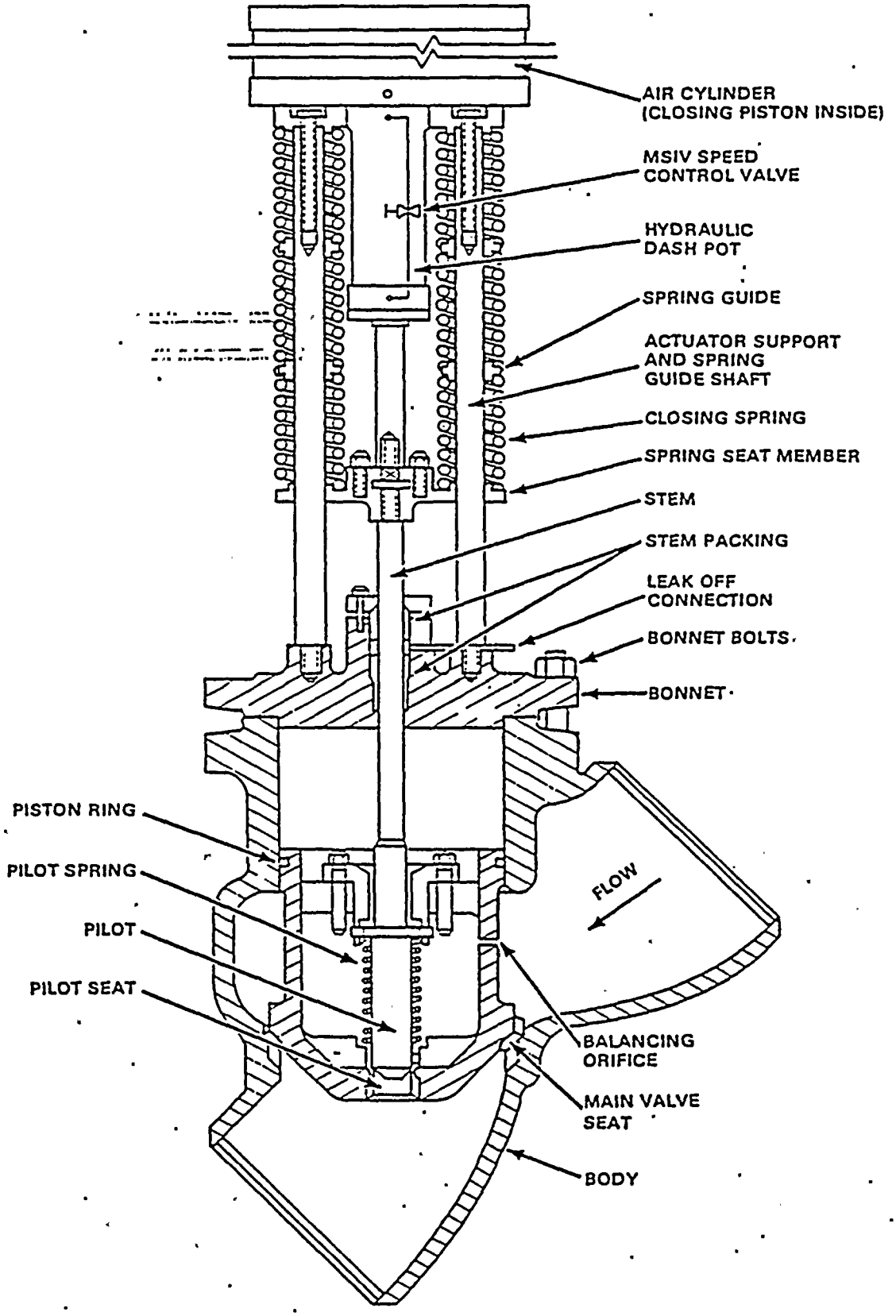


FIGURE 7. MAIN STEAM ISOLATION VALVE

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Recirculation Pump Trip

TABLE RPT-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration and testing and/or preventive or unscheduled maintenance activities and procedures, and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

PC - Periodic calibration activities, procedures and training.
PT - Periodic testing activities, procedures and training.
MT - Preventive or unscheduled maintenance activities, procedures and training.
OP - Normal and emergency operating procedures, check-off lists, training, etc.
TS - Technical specifications.

System Description
Mission Success Criteria

In the event that there is an Anticipated Transient Without Scram (ATWS) at WNP-2 there are several systems designed to mitigate this by reducing reactor power, through the insertion of negative reactivity. One system which was previously described is the Reactor Protection System (RPS). This system consists of a separate set of ATWS scram valves used to remove instrument air from the scram header that keeps the normal scram inlet and outlet valves closed. If these ATWS scram valves open, then the control rods should insert, shutting down the reactor. Another ATWS initiation systems is the Recirculation Pump Trip (RPT) system which is covered here. The Standby Liquid Control (SLC) system, which is addressed in a later table, also may be manually initiated to mitigate ATWS effects through injection of a neutron absorber solution for reactivity control.

The RPT system provides a mechanism for rapidly reducing core power in the event the normal reactor protection system scram function fails following an event requiring shutdown. RPT may be accomplished by either one of two independent methods:

- ATWS panel automatic trip of both recirculation pump motor-generator set field breakers on indication of low-low reactor water level and/or high reactor pressure (greater than or equal to 1150 psig), or

CONDITIONS THAT CAN LEAD TO FAILURE

- manual trip of both recirculatin pump motor-generator output breakers.

Success is trip of the recirculation pumps either automatically or manually.

Dominant Failure Modes

1. Generator Field Breaker Fails to Open

If the generator field breakers for both Recirculation Pump Motor-Generator (MG) sets fail to open in response to an automatic trip signal then the recirculation pumps will both continue to run and reactor power will not decrease. (MT,PT)

2. Operator Fails to Trip Recirculation Pumps

If the automatic trips do not function, the opertor should manually trip both recirculation pumps. (OP)

3. Failure of Auto Trip Signal Due to Miscalibration of Initiation Sensors or Failure of Relays in Trip Circuitry. (PC,PT,MT)

4. Drive Motor Breaker Failure

If the drive motor breaker for the recirculation MG set fails to open, then flow will continue in the main reactor recirculation loops. (MT,PT)

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Recirculation Pump Trip

TABLE RPT-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS	FAILURE MODES
41200	Training	Recirc. pump	2
61725	Surveillance Testing & Calibration Program	Recirc. MG set breakers Recirc. pump control switch	1,4 3
62702	Maintenance (refueling)	Recirc. MG set breakers	1,4

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Recirculation Pump Trip

TABLE RPT-3 MODIFIED SYSTEM WALKDOWN

1. Verify that there are no alarms in main control panel P602.

2. Verify that the following switches are in the "normal" position:

ATWS Test Switches	Location
S112A, S112B	MCR PNL P612, P613
Test bypass switches	MCR PNL P609, P611

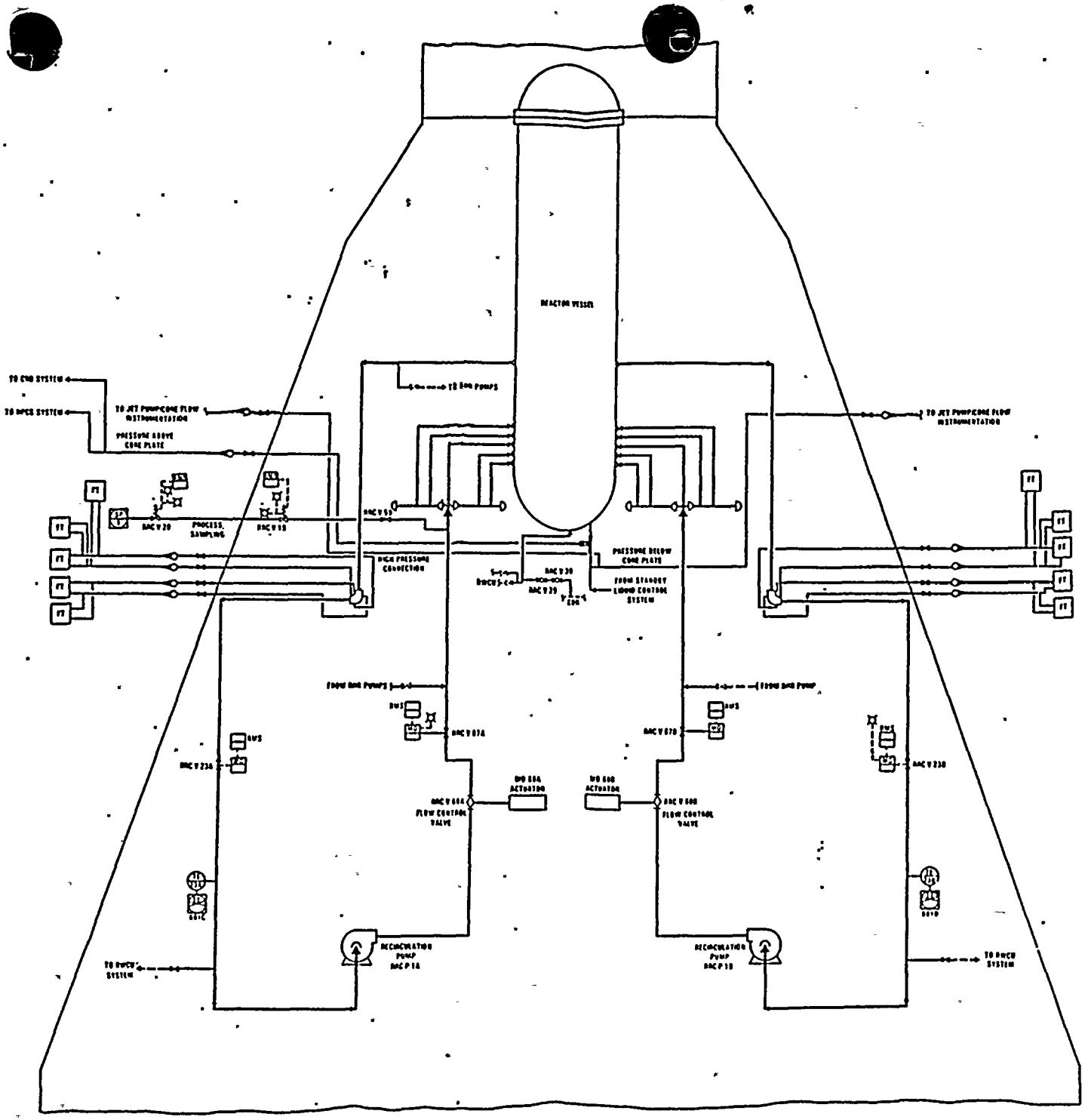


FIGURE 2 - REACTOR RECIRCULATION SYSTEM

831045 26LT
SEPT 1986
DRG

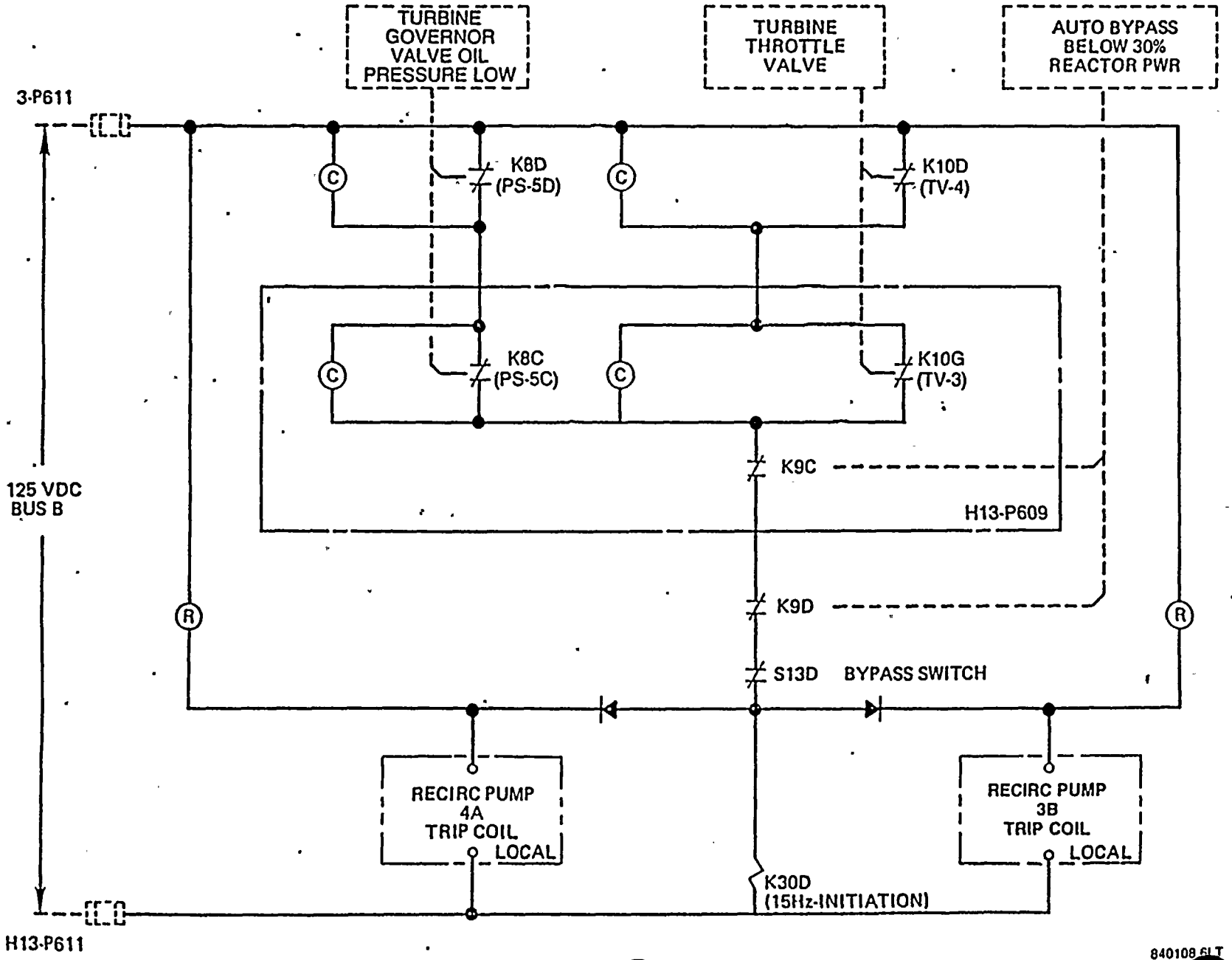


FIGURE 23. RECIRC PU[illegible]RIP SYSTEM "B"

840108 6LT SEPT[illegible]

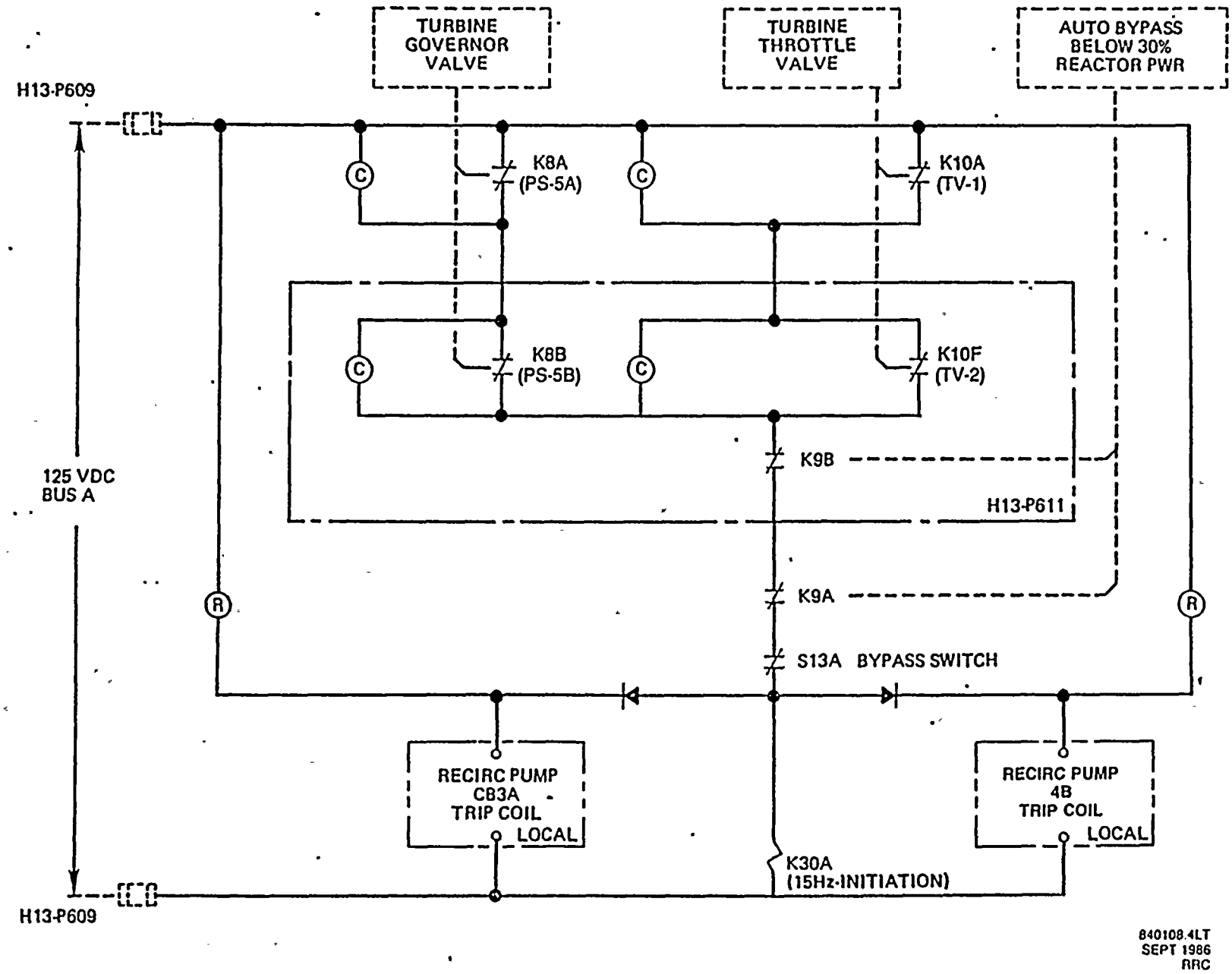


FIGURE 22. RECIRC PUMP TRIP SYSTEM "A"

WASHINGTON NUCLEAR PLANT NO. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Standby Liquid Control (SLC) System

TABLE SLC-1 IMPORTANCE BASIS AND FAILURE MODE IDENTIFICATION

CONDITIONS THAT CAN LEAD TO FAILURE

General Guidance

Surveillance of the licensee's periodic calibration, testing and/or preventive or unscheduled maintenance activities, procedures and training and/or normal and emergency operating procedures, training and check-off lists in accordance with the Technical Specifications and relevant NRC bulletins and information notices should reduce the probability of failure for the conditions listed below. The most relevant aspects are designated for each condition as follows:

- PC - Periodic calibration activities, procedures and training.
- PT - Periodic testing activities, procedures and training.
- MT - Preventive or unscheduled maintenance activities, procedures and training.
- OP - Normal and emergency operating procedures, check-off lists, training, etc.
- TS - Technical specifications.

Mission Success Criteria

The Standby Liquid Control (SLC) System is a redundant, independent, backup system for the control rod drive hydraulic control system. It consists of a storage tank, test tank, two 100% capacity pumps, two explosive squib valves, and associated valves, check valves, piping, instrumentation, and controls necessary to prepare and inject a neutron absorbing solution (sodium pentaborate) into the reactor for backup reactivity control. The quantity of neutron absorber to be injected is based upon the reactivity difference required to bring the reactor from steady state power operation at the most reactive condition anytime in core life to cold shutdown condition with allowances for shutdown margin, imperfect mixing, temperature, and dilution of recirculation loops and reactor water with RHR water for decay heat removal.

The system may be initiated manually from the control room via a three-positive keylock switch under the following conditions: reactor power unknown or greater than 5% per APRM's AND, reactor cannot be shutdown before suppression pool temperature reaches 110F. Switching from the OFF position to either "System A" or "System B" will: fire both explosive squib valves to the open position, open both SLC storage tank outlet valves, start the selected pump, and isolate SLC from the Reactor Water Cleanup System. The entire contents of the SLC storage tank are injected into the vessel over the next two hours unless directed otherwise by Emergency Operating Procedures. Successful injection is verified by observing decreasing reactor power level (approximately 1% per minute from 100% power) and decreasing SLC storage tank level.

TABLE SLC-1 (Cont'd)

CONDITIONS THAT CAN LEAD TO FAILURE

Failure Conditions

1. Operator fails to initiate SLC from system keylock control switch due to:

   a) Inadequate assessment of situation (OP)
   b) Human reluctance factor (OP)
   c) Inadequate keylock switch procedural controls (OP)

2. One of the two pumps SLC-P-1A or SLC-P-1B fails to start and the other out of service for maintenance. (MT,PT,TS)

3. Failure to properly restore system ater testing and maintenance. (PT,MT,OP,TS)

   a) SLC pumps SLC P-1A & 1B.
   b) SLC pumps suction isolation valves SLC-V-2A & 2B.
   c) SLC pumps discharge isolation valves SLC-V-3A & 3B.
   d) Explosive squib valves SLC-V-4A & 4B.
   e) Test tank inlet & outlet valves SLC-V-17 & 31.
   f) SLC circulation test valve SLC-V-16.
   g) Demin. supply to SLC pumps suction SLC-V-14.
   h) Storage tank outlet valves SLC-V-1A & 1B.
   i) Inlet to RPV SLC-V-8.
   j) Vent and drain valves.

4. Insufficient boron concentration due to:

   a) improper chemical analysis,(TS)
   b) excessive dilution, (OP)
      Demin. supply to SLC pump suction SLV-V-14
      RWCU system isolation valve RWCV-V-4
   c) inadvertent tank draining, (OP)
   d) insufficient mixing in reactor vessel, (OP)
   e) inadequate heating of storage tank results in boron precipitation. (OP,TS)

5. Loss of flow paths due to: (MT,PT,OP,TS)

   a) line plugged between tank and pumps, (MT,OP)
   b) valves/check valves fail to open, (MT,PT,OP,TS)
      explosive squib valves SLC-V-4A & 4B fail to fire (monitor licensee controls on explosive valve charges: procurement, storage, surveillance testing, shelf life),
      storage tank outlet valves SLC-V-1A & 1B fail to open,
      pump discharge check valves SLC-V-33A & 33B fail to open,
      outboard injection check valve SLC-V-6 fails to open,
      inboard injection check valve SLC-V-7 fails to open,
   c) tank/line rupture
      SLC-RV-29A or 29B failure, (MT)
      system improperly vented/filled.(OP)

WASHINGTON NUCLEAR PLANT No. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Standby Liquid Control (SLC) System

TABLE SLC-2 I&E INSPECTION PROCEDURES FOR SYSTEM OPERATION

PROCEDURE NUMBER	TITLE	COMPONENTS	FAILURE MODES
41700	Training	Manual initiation switches	1
61725	Surveillance and Calibration Control Program	Storage tank, Pumps, Manual Valves Check Valves	2-5
61726	Monthly Surveillance Observation		
71707	Operational Safety Verification		
71710	ESF System Walkdown		
62702	Maintenance	Manual valves, Pumps	2-5
62703	Monthly Maintenance Observation		

WASHINGTON NUCLEAR PLANT No. 2
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

Standby Liquid Control (SLC) System

TABLE SLC-3 MODIFIED SYSTEM WALKDOWN

DRAWING NO: M-522

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SLC-V-1A (MO) @	RX-548	SLC Storage Tank Outlet Valve	Closed		
SLC-V-1B (MO) @	RX-548	SLC Storage Tank Outlet Valve	Closed		
SLC-V-2A@	RX-548	SLC Pump 1A Suction Valve	Locked/ Open		
SLC-V-2B@	RX-548	SLC Pump 1B Suction Valve	Locked/ Open		
SLC-V-3A@	RX-548	SLC Pump 1A Discharge Valve	Locked/ Open		
SLC-V-3B@	RX-548	SLC Pump 1B Discharge Vale	Closed		
SLC-V-25A @	RX-548	SLC Pumps Discharge Line Drain Valve	Closed		
SLC-V-25B @	RX-548	SLC Pumps Discharge Line Drain Valve	Closed		
SLC-V-24A @	RX-548	SLC Pumps Discharge Line Drain Valve	Closed		
SLC-V-24B @	RX-548	SLC Pumps Discharge Line Drain Valve	Closed		
SLC-V-15@	RX-548	SLC Pumps Suction Line Drain Valve	Closed		
SLC-V-31@	RX-548	SLC Test Tank Outlet Valve	Locked/ Closed		

@ Requires independent verification of valve position by licensee personnel.

TABLE SLC-3 (Cont'd)
DRAWING NO: M-522

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SLC-V-18@	RX-548	SLC Test Tank Drain Valve	Closed		
SLC-V-14@	RX-548	DW Addition to SLC Pumps Suction	Locked/ Closed		
SLC-V-16@	RX-548	SLC System Circulation Test Valve	Locked/		
SLV-V-17@ @	RX-548	SLC Test Tank Inlet Valve	Closed		
SLC-V-47@	RX-548	SLC Test Line Vent Valve	Closed		
SLC-V-21@	RX-548	SLC Test Line Vent Valve	Closed		
SLC-V-10@	RX-548	DW Addition to SLC Storage Tank	Locked/ Closed		
SLC-V-26@	RX-522	Vent & Test Connection Valve at Containment	Closed		
SLC-V-27@	RX-522	Vent & Test Connection Valve at Containament	Closed		
SLC-V-40@	PC	Vent & Test Connection Valve at RPV	Closed		
SLC-V-41@	PC	Vent & Test Connection Valve at RPV	Closed		
SLC-V-8@	PC	Inlet to RPV	Locked/ Open		
DW-V-159 @	Rx-548	Demin Water Supply to SLC System	Open		Drawing M-517
SLC-V-601 @	RX-548	Test Line Connection	Closed		
SLC-V-603 @	RX-548	Test Line Connection	Closed		

@ Requires independent verification of valve position by licensee personnel.

TABLE SLC-3 (Cont'd)
DRAWING NO: M-522

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SLC-V-602 @	RX-522	Test Line Connection	Closed		
SLC-V-604 @	RX-522	Test Line Connection	Closed		
SLC-V-45@	PC	Drain Test Connection	Closed		
SLC-V-46@	PC	Drain Test Connection	Closed		
SLC-V-49@	RX-522	Drain Test Connection (V)	Closed		
SLC-V-606 @	RX-522	Drain Test Connection (V)	Closed		
SLC-V-48@	RX-522	2" Manual Valve	Closed		
SLC-V-605 @	RX-548	Test Connection (V) DW	Closed		
RWCU-V-4	Later	RWCU System Iso Valve	Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE SLC-3 (Cont'd)

DRAWING NO: M-522

B. POWER SUPPLY

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
MC-8B-CUB -8A @	522	SLC-P-1B SLC Pump 1B and SLC-V-4B	Closed		
MC-8B-CUB -8B @	522	SLC-EHC-3 Mixing Htr	Closed		
MC-8B-CUB -8C @	522	SLC-EHC-2 Maintaining Heater	Closed		
MC-8B-CUB -9A @	522	SLC-V-1B SLC Storage Tank Outlet Valve	Closed		
MC-7B-CUB -8C @	522	SLC-P-1A SLC Pump 1A and SLC-V-4A	Closed		
MC-7B-CUB -7D @	522	SLC-V-1A SLC Storage Tank Outlet Valve	Closed		
MC- later	later	RWCU-V-4 RWCU System Isolation Valve	Closed		

@ Requires independent verification of circuit breaker position by licensee personnel.

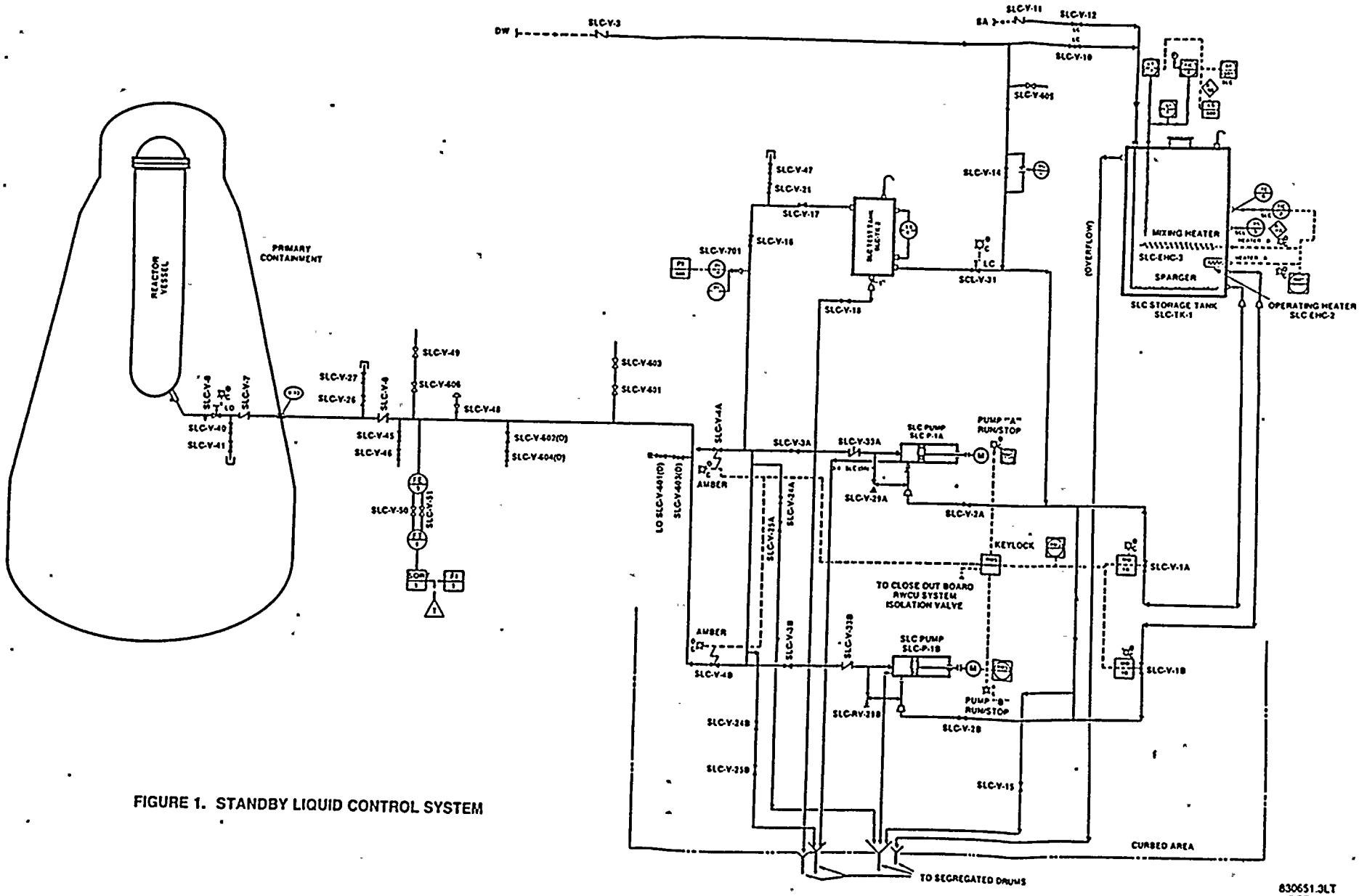


FIGURE 1. STANDBY LIQUID CONTROL SYSTEM

830651.3LT
OCT 1986
SLC

WASHINGTON NUCLEAR PLANT NO. 1
GENERIC PROBABILISTIC RISK ASSESSMENT-BASED
INSPECTION PLAN

High Pressure Core Spray (HPCS) System

TABLE HPCS-3 MODIFIED SYSTEM WALKDOWN

DRAWING NO: M-520

I. HPCS PUMP/MOTOR

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
HPCS-V-1	RB-422	Suction from CST MOV	Open		
HPCS-V-701	RB-422	Root Valve for PS-3	Open		
HPCS-V-703	RB-422	Root Valve for PX-1	Closed		
HPCS-V-704	RB-422	Root Valve for PX-1	Closed		
HPCS-V-80 @	RB-422	HPCS-P-1 Seal Drain	Open		
HPCS-V-81 @	RB-422	HPCS-P-1 Seal Drain	Open		
HPCS-V-705	RB-422	Root Valve for PX-3	Closed		
HPCS-V-12	RB-422	HPCS-P-1 Minimum Flow MOV	Closed		
HPCS-V-53 @	RB-422	Minimum Flow Line Iso	Locked/ Open		
HPCS-V-34	RB-422	HPCS-P-3 Suction Iso	Open		
HPCS-V-77	RB-422	HPCS-P-3 Minimum Flow	Open		
HPCS-V-707	RB-422	Root Valve for PI-1G	Open		
HPCS-V-6	RB-422	Root Valve for PIS-13	Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE HPCS-3 (Cont'd)

DRAWING NO: M-520

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
HPCS-V-708@	RB-422	Root Valve for PIS-13	Open		
HPCS-V-709@	RB-444	Root Valve for FI-5, FIS-6, & FI-603	Open		
HPCS-V-710@	RB-444	Root Valve for FI-5, FIS-6 & FI-603	Open		
HPCS-V-15	RB-444	Suppression Pool Suction MOV	Closed		
HPCS-V-19	RB-444	HPCS Suction Tie to RHR	Locked/ Closed		
HPCS-V-10	RB-444	HPCS-P-1 Test to CST MOV	Closed		
HPCS-V-712	RB-444	Root Valve for PI-2	Open		
HPCS-V-11	RB-444	HPCS-P-1 Test to CST MOV	Closed		
HPCS-V-23	RB-444	HPCS-P-1 Test to Suppression Pool MOV	Closed		
HPCS-V-64	RB-444	HPCS-P-1 Test to Pool Isolation	Locked/ Open		
HPCS-V-65	RB-501	Control Air Isol for V-5	Locked/ Closed		
HPCS-V-68	RB-501	Control Air Isol for V-5	Locked/ Closed		
HPCS-V-69	RB-501	Control Air Bleed Vlv	Closed		
HPCS-PI-VX-732	RB-536	HPCS-DPIS-9 (45°)	Open		

@ Requires independent verification of valve position by licensee personnel.

TABLE HPCS-3 (Cont'd)

DRAWING NO: M-520

A. VALVE CHECKLIST

VALVE NUMBER	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
HPCS-V-5	DW-547	Testable Check Valve	Closed		
HPCS-V-76 @	DW-547	Future SLC Connection Isolation	Closed +		
HPCS-V-37 @	DW-547	Test Connection Iso (55',236°)	Closed		
HPCS-V-38 @	DW-547	Test Connection Iso (551', 236°)	Closed		
HPCS-V-51	DW-547	Injection Line Iso Valve (551',240°)	Locked/ Open		
HPCS-V-102	CONT-518	High Point Vent for DPIS 9	Closed +		
HPCS-V-3	RB-522	Condensate Flushing Supply Isolation	Locked/ Closed		
HPCS-V-31	RB-522	Condensate Flushing Supply isolation	Closed		
HPCS-V-4	RB-522	Injection Line MOV	Closed		
COND-V-9A @	CST Area	COND Supply COND-P-3.4.5	Locked/ Open		
COND-V-9B @	CST Area	COND Supply COND-P-3.4.5	Locked/ Open		
COND-V-13A@	CST ARea	Test Return to COND-TK-1A	Locked/ Open		
COND-V-13B@	CST Area	Test Return to COND-TK-1B	Locked/ Open		

@ Requires independent verification of valve position by licensee personnel.
+ Valve capped

TABLE HPCS-3 (Cont'd)
DRAWING NO: M-520

B. POWER SUPPLY CHECKLIST

POWER SUPPLY	LOC. BLDG. ELEV.	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	COMMENTS
SM-4	DG Room	High Pressure Core Spray (P-1)	Racked In		
MC-4A	DG Room	HPCS Water Leg Pump (P-3) (CUB 1C)	Closed		See Note
MC-4A	DG Room	HPCS Suction From CST (V-1)(CUB 2D)	Closed		See Note
MC-4A	DG Room	HPCS Injection Valve (V-4) (CUB 5B)	Closed		
MC-4A	DG Room	HPCS Inboard Return CST (V-10)(CUB 2E)	Closed		
MC-4A	DG Room	HPCS Outboard Return to CST (V-11)(CUB 3A)	Closed		
MC-4A	DG Room	HPCS Minimum Flow Valve (V-12) (CUB 3B)	Closed		See Note
MC-4A	DG Room	HPCS Suppression Pool Suction (V-15)(CUB3C)	Closed		See Note
MC-4A	DG Room	HPCS Test Valve (V-23) (CUB 3D)	Closed		
PP-4A	DG Room	HPCS-V-5, HPCS-V-51 Ckt 9	Closed		
PP-4A	DG Room	HPCS-V-5 Ckt 11	Closed		
PP-4A	DG Room	PT-4, FT-5 Ckt 8	Closed		
125 VDC HPCS Dist	DG Room	HPCS Logic Ckt D-7	Closed		
125 VDC HPCS Dist	DG Room	HPCS-V-10 HPCS-V-11 Position Indication Ckt D-9	Closed		

NOTE: Licensee personnel are instructed that if these breakers are open, not to close them until directed by the Control Room Operator, and to see filling and venting instructions.

TABLE HPCS-3 (Cont'd)

II. HPCS DIESEL GENERATOR

Refer to Table EP-4, "Proposed Inspection Plan for Diesel Generators at Nuclear Power Plants."

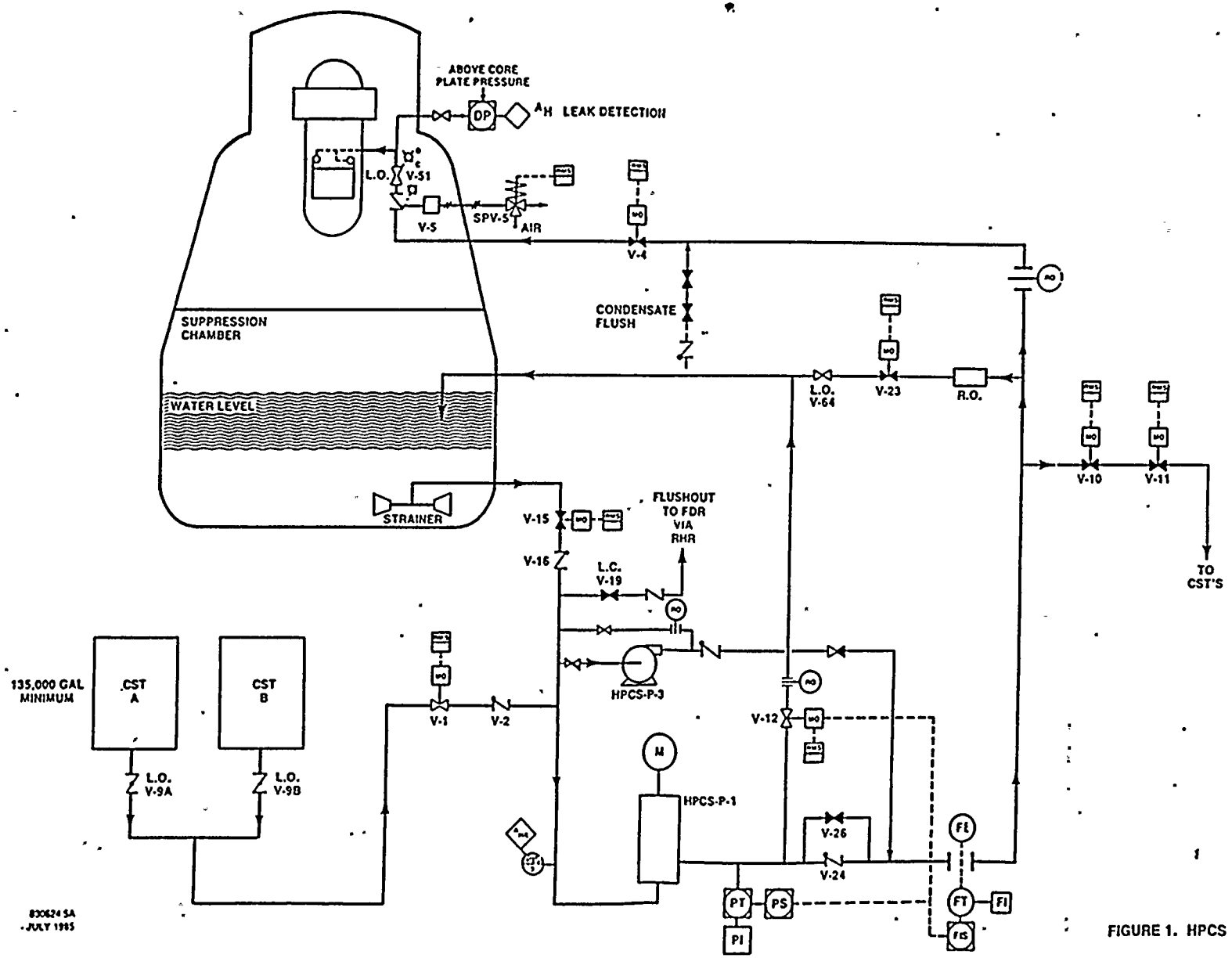


FIGURE 1. HPCS