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WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 2

PUMP AND VALVE INSERVICE TEST PROGRAM PLAN

PUMP AND VALVE INSERVICE TEST

PROGRAM PLAN - REV. 1

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NUCLEAR PROJECT NO. 2

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Reviewed by	D. A. Walker Plant QA Mgr for Manager, Operational Quality Assurance	9/1/82 Date
Reviewed by	[illegible] Authorized Nuclear Inservice Inspector	9/3/82 Date

RECORD OF PROGRAM PLAN REVISIONS

No.	DATE	REVISIONS		BY	CHK'D	APP'D
1	8/28/82			MPRees	RL Webring	TF Hoyle
0	4/23/81	ORIGINAL		MPRees	F. Frisch	D.W. Foster

TITLE	SHEET	DATE/REV.	TITLE	SHEET	DATE/REV.
Title Sheet	i	N/A	3.0 Pump Test Program (Contd)	3-12	1
Sign Orig.	ii	1		3-12a	0
Records of Revision	iii	0		3-12b	0
				3-13	1
				3-14	1
				3-15	1
1.0 Intro.	1-1	1		3-16	1
				3-17	1
2.0 Table of Contents	2-1	1		3-18	1
				3-19	1
3.0 Pump Test Program	3-1	1		3-20	1
	3-2	1		3-21	1
	3-3	1		3-22	1
	3-4	1		3-23	0
	3-5	1		3-24	0
	3-6	0		3-25	1 (was 3-24)
	3-7	1		3-26a	1 (was 3-25)
	3-7A	0		3-26b	0
	3-8	0	4.0 WNP-2 Valve Inservice Test Program	4-1	1
	3-9	1		4-2	1
	3-10	1		4-3	1
	3-11	1		4-4	0
	3-11a	Deleted		4-5	0

TITLE	SHEET	DATE/REV.	TITLE	SHEET	DATE/REV.
4.0 WNP-2	4-6	0	4.0 WNP-2	4-26	1
Valve Inservice	4-7	0	Valve Inservice	4-27	1
Test Program	4-8	1	Test Program	4-27a	0
(Contd)	4-9	1	(Contd)	4-28	1
	4-10	1		4-29	1
	4-11	1		4-30	1
	4-12	1		4-31	1
	4-13	1		4-32	1
	4-14	1		4-33	1
	4-15	1		4-34	1
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	4-19	1		4-38	1
	4-20	1		4-39	1
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	4-23	1		4-42	1
	4-23a	0		4-43	0
	4-24	1		4-44	1
	4-25	1		4-45	0

TITLE	SHEET	DATE/REV.	TITLE	SHEET	DATE/REV.
4.0 WNP-2	4-46	1	4.0 WNP-2	4-66	1
Valve Inservice	4-47	0	Valve Inservice	4-67	1
Test Program	4-48	0	Test Program	4-68	0
(Contd)	4-49	1	(Contd)	4-69	0
	4-50	1		4-70	1
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	4-64	1			
	4-65	1			

TITLE	SHEET	DATE/REV.	TITLE	SHEET	DATE/REV.
5.0 Quality			Floor Drain Radioactive	M 539	37
Assurance Program	5-1	0	Containment Cooling&Purge	M 543	27
			Containment Atmos. Control	M 554	21
6.0 Flow Diagrams	6-1		Containment Instru. Air	M 556	17
Control Service Air	M 510*	43	Main Steam Leakage Cont.	M 557	.11
Diesel Oil & Misc. Systems	M 512	20	Steam and Liquid Sam.	M 607 sh. 2	7
Reactor Core Iso. Cooling	M 519	27			
Low Pressure Core Spray	M 520	25			
High Pressure Core Spray	M 520	25			
Residual Heat Removal	M 521	32			
Standby Liq. Control	M 522	12			
Reactor Water Cleanup	M 523	39			
Standby Service Water	M 524	30			
Reactor Closed Cooling	M 525	26			
Fuel Pool Cooling	M 526	34			
Control Rod Drive	M 528	25			
Main Steam	M 529	29			
Reactor Feedwater	M 529	29			
Reactor Recirc. Cooling	M 530	27			
Equip. Drain Radioactive	M 537	33			

*Burns & Roe Flow Diagram Number

1.0 INTRODUCTION

This Pump and Valve Inservice Test Program Plan is applicable to the WPPSS Nuclear Project No. 2, hereinafter referred to as WNP-2. A single unit Boiling Water Reactor (BWR), the power plant is located 11 miles north of Richland, Washington, on the Hanford Reservation. The plant employs a General Electric (GE) supplied nuclear steam supply system designated as BWR/5. The reactor is contained within an over-under drywell/wetwell containment vessel designated Mark II. The plant rated electrical output is 1,094 MWe.

This program plan has been prepared as the controlling document governing Pump and Valve Inservice Testing at WNP-2. The requirements for Pump and Valve Inservice Testing are outlined in the ASME Boiler and Pressure Vessel Code, Section XI, entitled "Rules for Inservice Inspection of Nuclear Power Plant Components." The scope of this plan encompasses the testing of ASME Section III Nuclear Class 1, 2 and 3 pumps and valves, as defined by Sub-sections IWP and IWV of ASME Section XI.

The WNP-2 FSAR commits to testing Class 1, 2 and 3 pumps and valves according to the requirements of Section XI of the ASME Boiler and Pressure Vessel Code, 1977 Edition with Addenda through Summer 1978. However, Revision 1 is written to comply with the requirements of the 1980 Code Edition with addenda through Winter, 1980. This is consistent with federal requirements for component testing as stated in Title 10, Code of Federal Regulations, part 50 (10CFR50.55a(g)).

This Program Plan is comprised of two independent subprograms - the Pump Inservice Test Program and the Valve Inservice Test Program. The development, implementation and administration of these two programs is detailed in subsequent sections (3.0 and 4.0).

2.0 TABLE OF CONTENTS

3.0 WNP-2 Pump Inservice Test Program

3.1 Program Development Philosophy

Highly reliable safety related equipment is a vital consideration in the operation of a nuclear generating station. To help assure operability, the WNP-2 Pump Inservice Test Program (Section 3.5) has been developed.

The Program is designed to detect and evaluate significant hydraulic or mechanical change in the operating parameters of vital pumps and to initiate corrective action when necessary. The Program is based on the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWP. To the maximum extent practical, the Program complies with the specifications of the approved Codes,[1] regulations [2] and guidelines.[3]

Consistent with the intent of Subsection IWP, the Supply System has incorporated into this program certain requirements which exceed the specifications of the Code. In particular, the Diesel Fuel Oil Transfer Pumps are included for testing due to their potentially significant impact on plant safety.

The Supply System recognizes that design differences among plants may render impractical certain Code requirements. For example, it is not practical to require suction pressure measurement on vertical turbine ("deep well") type pumps. Where such impracticalities exist, they have been substantiated as exceptions as allowed by the Code. Alternate testing requirements have been proposed when warranted. The Relief Requests which document the exceptions comprise Section 3.6.

The Supply System is confident that the WNP-2 Pump Inservice Test Program complies with the intent of the approved Codes,[1] regulations[2] and guidelines[3] and contributes to ensuring the safety of the general public.

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1. ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWP, (1980 Edition with Addenda through Winter, 1980).
2. 10CFR 50:55 a(g).
3. NRC Staff Guidelines for complying with certain provisions of 10CFR 50:55 a(g) "Inservice Inspection Requirements".

3.2 Program Implementation

Surveillance testing is performed to detect equipment malfunction or degradation and to initiate corrective action. Since the safety related pumps are normally in a standby mode, periodic testing of this equipment is especially important. The WNP-2 Pump Inservice Test Program provides a schedule for testing safety related pumps and will be implemented as part of the normal surveillance routine.

It is anticipated that reference data will be gathered during initial surveillance tests. In most cases, test parameters will be measured with normal plant instrumentation. This approach will simplify the test program and will promote timely completion of surveillance testing. When permanently installed instrumentation is not available, portable instrumentation will be used to record the required parameters.

During subsequent surveillance tests, flow rate will normally be selected as the independent test parameter and will be set to match the reference flow rate. Then other hydraulic and mechanical performance parameters will be measured and evaluated against the appropriate reference values. The results of such evaluations will determine whether or not corrective action is warranted.

Each pump in the Pump Test Program will be tested according to a detailed test procedure. The procedure will include, as a minimum:

a) Statement of Test Purpose. This section will identify test objectives, reference applicable Technical Specifications and note the operating modes for which the test is appropriate.

b) Prerequisites for Testing. System valve alignment, equipment for proper pump operation (cooling water, ventilation, etc.) and additional instrumentation (e.g., portable temperature or vibration monitors) will be noted. Identification numbers, range and calibration verification of additional instrumentation will be recorded.

c) Test Instructions. Directions will be sufficiently detailed to assure completeness and uniformity of testing. Instructions will include provisions for returning system to its normal standby configuration following testing. (For informational purposes, proposed flow paths are illustrated in Section 3.7.)

d) Acceptance Criteria. The ranges within which test data will be considered acceptable will be established by the Supply System and included in the test procedure. In the event that the data fall outside the acceptable ranges, operator action will be governed by approved Administrative Procedures.

Finally it is recognized that the Pump Inservice Test Program sets forth minimum testing requirements. Additional testing will be performed, as required, after pump maintenance or as determined necessary by the Plant Staff.

3.3 Program Administration

The operations staff of WNP-2 is responsible for the administration and execution of the Pump Inservice Test Program. The Program will be officially implemented upon the issuance of an Operating License and will govern pump testing for a 120 month period. Prior to that time, the Program will be reviewed and upgraded periodically to assure continued compliance with 10CFR 50:55a (g)(4). The Program may also be used as part of the pre-fuel loading surveillance testing program. Subsequent to Operating License, the program will be revised to reflect current ASME requirements consistent with 10CFR 50:55a (g)(4).

3.4 Pump Reference List

This list gives a brief description of each pump identified in the Pump Test Program. The pumps' ASME Code Classifications are specified in the Program.

HPCS-P-1

The High Pressure Core Spray pump provides emergency cooling spray to the reactor core. It is capable of injecting coolant at pressures equal to or above normal reactor operating pressures. The pump can take suction from the Condensate Storage Tank or from the Suppression Pool.

HPCS-P-2

This pump is dedicated to providing cooling water to the HPCS Emergency Diesel Generator, the standby power source for the High Pressure Core Spray System. HPCS-P-2 is located in the Pump House and takes suction from the spray pond.

LPCS-P-1

A high capacity, low head pump, the Low Pressure Core Spray pump provides cooling spray to the reactor core upon receipt of loss of coolant signal. LPCS-P-1 takes suction from the suppression pool except when testing to the Reactor Pressure Vessel.

RHR-P-2A, 2B, 2C

The Residual Heat Removal pumps are high capacity, low head pumps which have multiple uses during normal and emergency plant conditions. Briefly the system:

a) In conjunction with other systems, restores and maintains reactor coolant inventory in the event of a LOCA

b) Removes decay heat after shutdown

c) Cools the suppression pool

d) Condenses steam generated during Hot Standby

e) Can provide cooling spray to upper and lower drywell and to the wetwell

f) Can assist in fuel pool cooling

g) Can provide a condensing spray to the reactor head

h) Provides a flow path for Standby Service Water in case containment flooding is required.

Pumps take suction from the suppression pool in the standby operating mode.

SLC-P-1A, 1B

The Standby Liquid Control pumps are used to inject negative reactivity (sodium pentaborate) into the core independently of the control rod system. Suction is obtained from a storage tank containing the sodium pentaborate solution.

SW-P-1A, 1B

The Standby Service Water pumps supply cooling water to separate trains of safety related equipment. The pumps take suction on their respective spray ponds but eventually discharge to the opposite pond. The two ponds are the ultimate heat sink during loss of offsite power conditions.

RCIC-P-1

The turbine driven Reactor Core Isolation Cooling pump supplies coolant to the core in the event of reactor vessel isolation. It can take suction from either the Condensate Storage Tank or from the suppression pool.

DO-P-1A, 1B, 2

These pumps transfer diesel generator fuel oil from the subterranean storage tanks to the diesel's Day Tanks. Pump 2 is dedicated to the HPCS Diesel. The discharge lines of Pump 1A and 1B are cross tied, and each pump can supply fuel to either Diesel 1A or 1B.

FPC-P-1A, 1B

The Fuel Pool Circulation (FPC) pumps take suction on the spent fuel pool and discharge through the FPC heat exchangers and, during normal operation, through the Fuel Pool Filter/Demineralizers.

3.5 Pump Inservice Test Tables

The Test Table is the heart of the Pump Test Program. It presents a graphic display of the type and frequency of testing which the Supply System intends for its Class 1, 2 and 3 pumps. The Table incorporates the exceptions requested in Section 3.6 (Relief Requests).

WNP-2 Pump Inservice Test Table

IWP Parameter

Pump Ident.	ASME Code Class	Inlet Pressure, P_i	Discharge Pressure, P_o	Differential Pressure, P	Flowrate, Q	Vibration, V	Bearing Temperature T_b	Pump Speed, R	Lubrication Level/ Pressure	Relief Request(s)
HPCS-P-1	2	Q	Q	Q	Q	Q	N/A	NR	Q	4
HPCS-P-2	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	4,5
LPCS-P-1	2	Q	Q	Q	Q	Q	N/A	NR	Q	4
RHR-P-2A	2	Q	Q	Q	Q	Q	N/A	NR	Q	4
RHR-P-2B	2	Q	Q	Q	Q	Q	N/A	NR	Q	4
RHR-P-2C	2	Q	Q	Q	Q	Q	N/A	NR	Q	4
SLC-P-1A	2	N/A	Q	N/A	Q	Q	N/A	NR	Q	2
SLC-P-1B	2	N/A	Q	N/A	Q	Q	N/A	NR	Q	2
SW-P-1A	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	4,5
SW-P-1B	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	4,5
RCIC-P-1	2	Q	Q	Q	Q	Q	A	Q	Q	
DO-P-1A	3	Q See Note A	Q	Q	Q	Q	N/A	NR	Q	4
DO-P-1B	3	Q See Note A	Q	Q	Q	Q	N/A	NR	Q	4
DO-P-2	3	Q See Note A	Q	Q	Q	Q	N/A	NR	Q	4
FPC-P-1A	3	Q	Q	Q	Q	Q	N/A	NR	Q	4
FPC-P-1B	3	Q	Q	Q	Q	Q	N/A	NR	Q	4

Legend

Q = Quarterly (92 day interval) test
A = Annual test
N/A = Not applicable. See Relief Requests
NR = Not required
IWP - 4400 does not require pump speed measurement if pump is directly coupled to a constant speed motor driver.

Note A:

Storage Tank levels will be recorded and correlated to pressure in order to determine Pi and Δ P.

3.6 Pump Test Program Relief Requests

Relief Requests identify Code requirements which are impractical for WNP-2 and provide technical justification for the requested exception. Where appropriate, they also propose alternate testing to be performed in lieu of the Code requirements.

RELIEF REQUEST RP-1

(Deleted)

RELIEF REQUEST RP-2

Pump(s)

SLC-P-1A
SLC-P-1B

Section XI Code Requirement
for which Relief is requested

Measure pump inlet pressure, P_i, and pump differential pressure, ΔP. (IWP-3100).

Bases for Request

1. The SLC pumps are positive displacement pumps which, at a constant speed, deliver essentially the same capacity at any pressure within the capability of the driver and the strength of the pump. The SLC pumps are directly coupled to constant speed drive motors.

2. Surveillance requirements specify system alignments which assure adequate NPSH for the pumps.

3. There is no provision for suction pressure instrumentation.

4. Acceptable discharge pressure and flowrate will suffice as proof of adequate suction pressure.

Alternate Testing Proposed

Pump discharge pressure and flowrate will be measured and recorded during testing.

Quality/Safety Impact

Measurement of these parameters assures acceptable level of quality and safety since inadequate suction pressure would be indicated by erratic discharge pressure indication, subnormal flow rates and increased pump vibration and noise. These abnormal indications will be investigated and corrected as required by IWP-3200.

RELIEF REQUEST RP-3

(Deleted)

RELIEF REQUEST RP-4

Pump(s)

HPCS-P-1,	RHR-P-2A,	SW-P-1A,	DO-P-1A	FPC-P-1A
HPCS-P-2,	RHR-P-2B,	SW-P-1B,	DO-P-1B	FPC-P-1B
LPCS-P-1,	RHR-P-2C,		DO-P-2	

Section XI Code Requirement
for which Relief is Requested

Measure bearing temperature and vibration. (IWP-3100)

Bases for Request

1. Except for FPC pumps, these pumps are vertical turbine ("deep well") type pumps and are immersed in the fluid being pumped. This precludes measuring pump bearing vibration except for inboard bearings.

2. IWP-4300 only requires temperature measurement of "centrifugal pump bearings outside the main flow path". The outboard and intermediate bearings of all pumps are in the main flow path. Therefore, temperature measurement of these bearings is not required. The inboard bearings of the RHR pumps, LPCS-P-1 and HPCS-P-1, are cooled by the seal injection water which returns internally to the discharge flow. The inboard bearing on HPCS-P-2 (the head bearing), SW-P-1A and 1B, and DO-P-1 A, 1B, and 2 are cooled by the pumped fluid which returns to the discharge flow with no provision for temperature measurement.

3. Although the FPC bearings are accessible, bearing housing temperature is not necessarily an accurate predictor of bearing condition. Hence, temperature measurement is an unnecessary requirement with unreliable results.

Alternate Testing Proposed

1. Except for FPC pumps, axial and radial vibration velocity measurement will be taken at the outboard bearing of the pump's motor. Radial vibration velocity measurements will be taken as close as practical to the inboard pump bearing.

2. Vibration velocity measurements will be taken on the inboard and outboard bearings of the FPC pumps.

3 Alert level will be $0.157 \leq V_b < 0.314$ in/sec. Required action level will be $V_b \geq 0.314$ in/sec. The General Machinery Vibration Severity Chart is provided for information purposes.

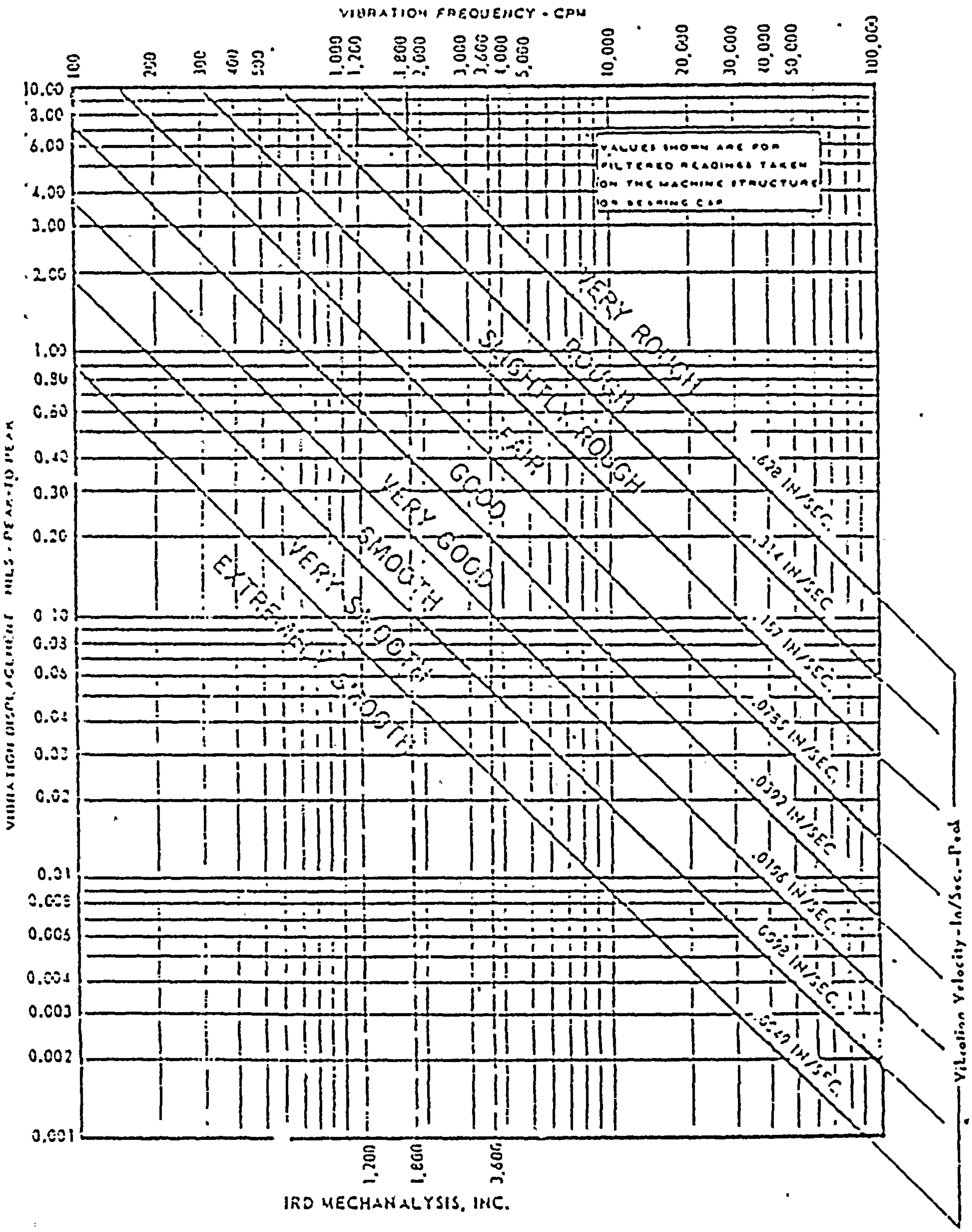
Quality/Safety Impact

Measurement of vibration velocity provides more concise and consistent information with respect to pump and bearing condition. The usage of vibration velocity measurements can provide information as to a change in the balance of rotating parts, misalignment of bearings, worn bearings, changes in internal hydraulic forces and general pump integrity prior to the condition degrading to the point where the component is jeopardized. Bearing temperature does not always predict such problems. An increase in bearing temperature may not occur until the bearing has deteriorated to a point where additional pump damage may occur. Bearing temperatures are also affected by the temperatures of the medium being pumped, which could yield misleading results. Vibration readings are not affected by the temperature of the medium being pumped, thus the readings are more consistent. The proposed alternate testing will result in the maximum meaningful data regarding pump bearing condition. Since vibration velocity analysis is more predictive in nature than bearing temperature measurement, the alternate testing serves to increase levels of safety and quality.

RP- 4

GENERAL MACHINERY VIBRATION SEVERITY CHART

For use as a GUIDE in judging vibration as a warning of impending trouble.



IRD MECHANALYSIS, INC.

... chart can be used to cross-reference displacement with frequency to determine vibration seve...

RELIEF REQUEST RP-5

Pump(s)

HPCS-P-2 SW-P-1A
SW-P-1B

Section XI Code Requirement
for which Relief is Requested

Measure pump inlet pressure, P_i, and differential pressure, ΔP. (IWP-3100)

Bases for Request

(1) SW-P-1A, 1B and HPCS-P-2 are vertical turbine type pumps which are immersed in their water source. They have no suction line which can be instrumented.

(2) Technical Specifications will state minimum allowable spray pond level to assure adequate NPSH and cooling water supplies.

(3) Difference between allowable maximum pond level and minimum level is only six (6) inches of water or 0.2 psi. This small difference will not be significant to the Test Program and suction pressure will be considered essentially constant.

(4) Acceptable flowrate and discharge pressure will suffice as proof of adequate suction pressure.

Alternate Testing Proposed

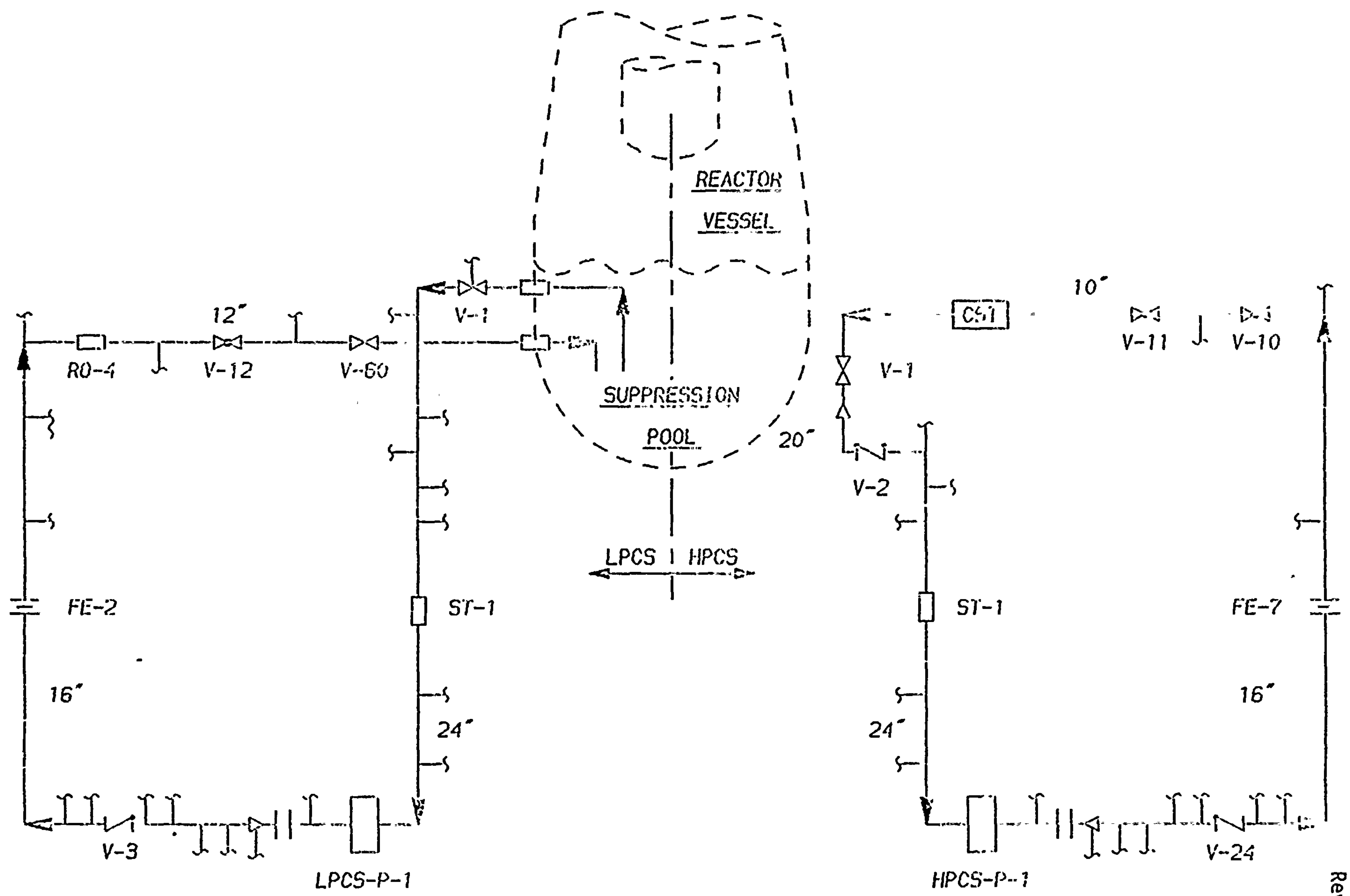
Spray pond level and pump discharge pressure will be recorded during the testing of these pumps.

Quality/Safety Impact

The effect of granting this request will be to introduce an error of 0.5 ft./500 ft. = 0.1% at rated discharge flow for SW-P-1A and 1B and an error of 0.5 ft/135 ft. = 0.37% for HPCS-P-2. These small errors will not significantly impact the quality of test results nor jeopardize the safety of the public.

3.7 Proposed Pump Test Flow Paths

These flow paths are proposed for use during pump testing and may be used during the valve test program. The valve alignment shown on these drawings reflect valve position during testing. Valve position during operations may be different. Surveillance procedures will define actual flow paths.



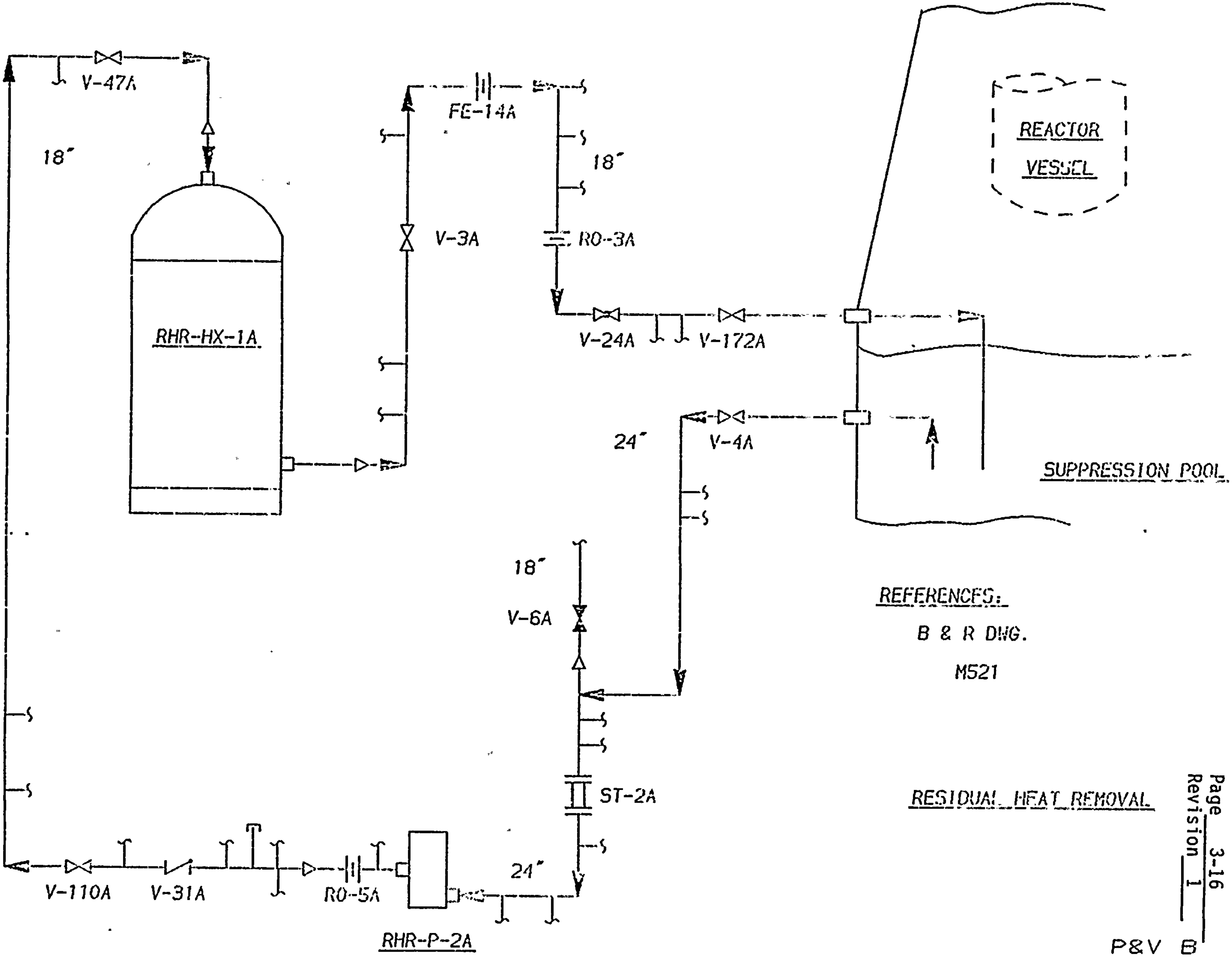
REFERENCES:

B & R DWG.

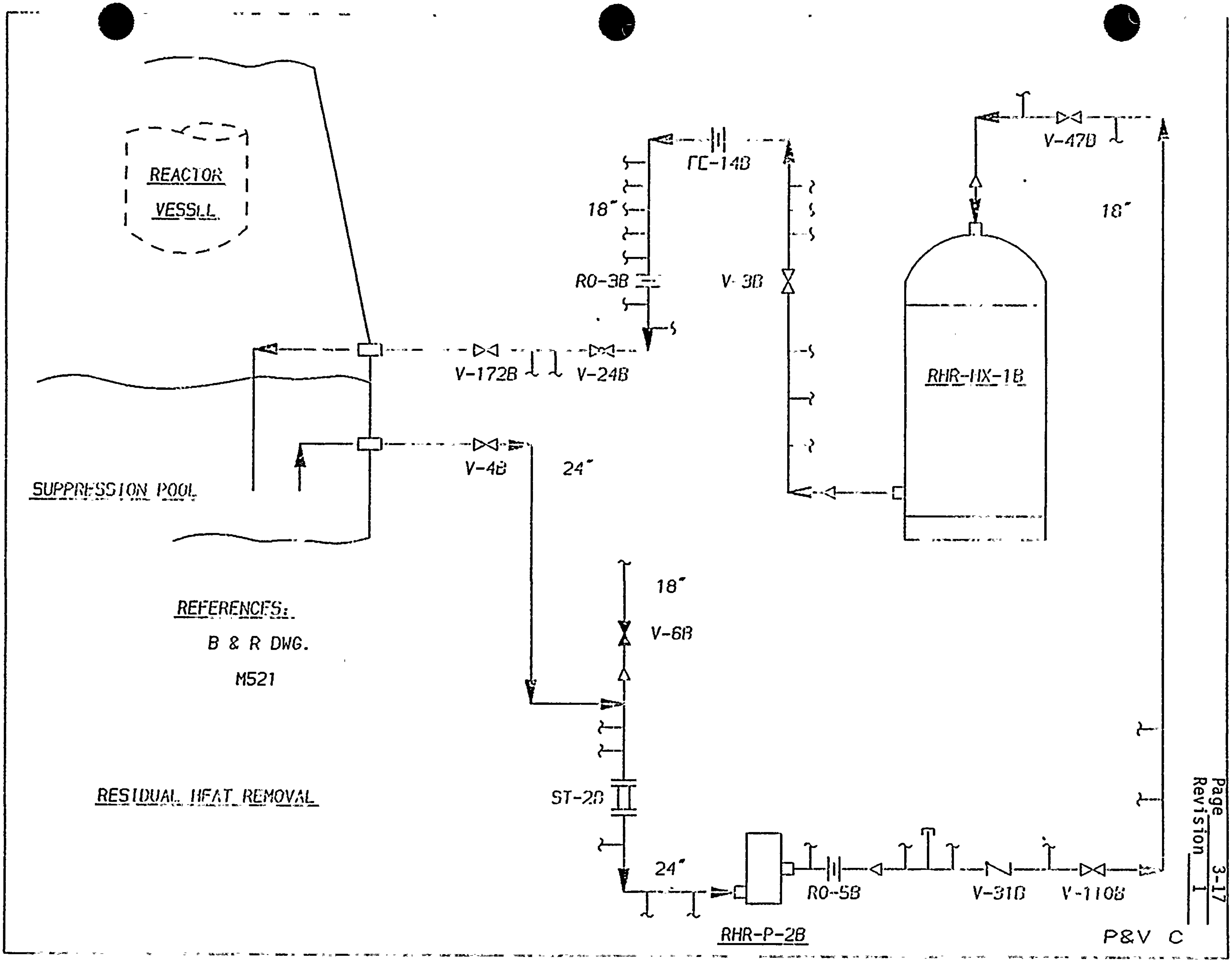
M520

HIGH PRESSURE CORE SPRAY

LOW PRESSURE CORE SPRAY



RESIDUAL HEAT REMOVAL



P&V C

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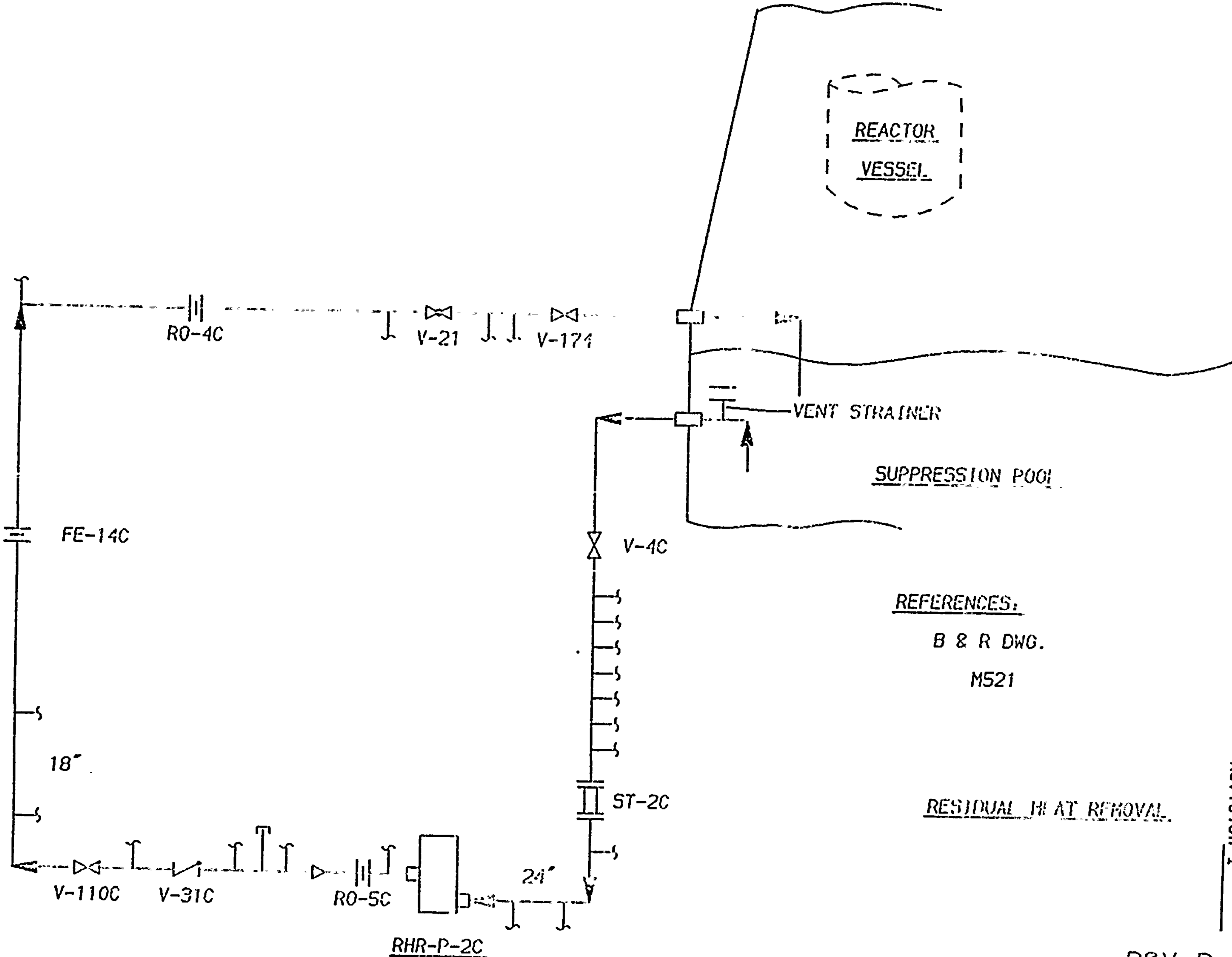
Revision 1



REFERENCES:

B & R DWG.

M521

RESIDUAL HEAT REMOVAL

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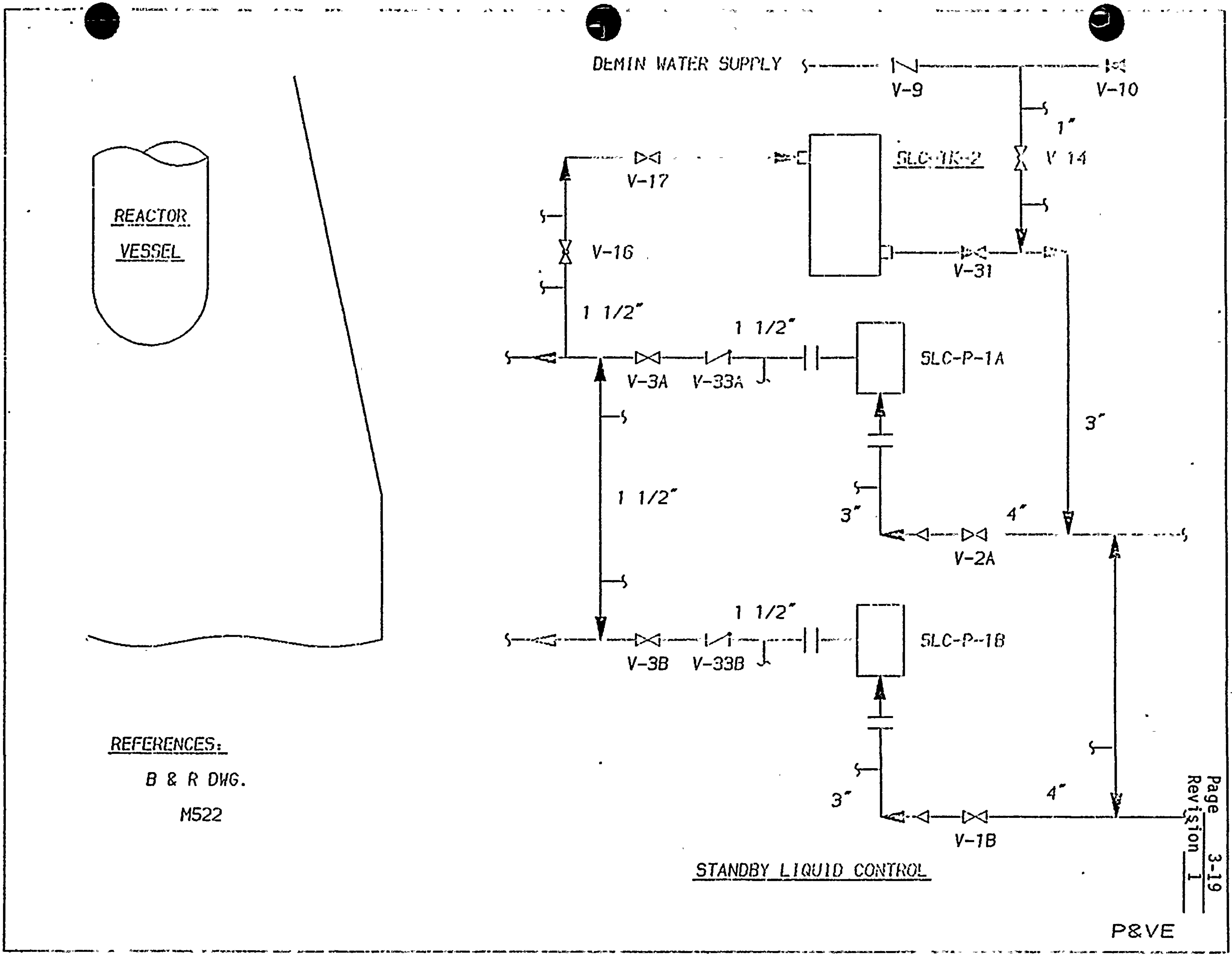
P&V D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V-10
1"
V 14
SLC-TK-2
V-17
REACTOR
VESSEL
V-16
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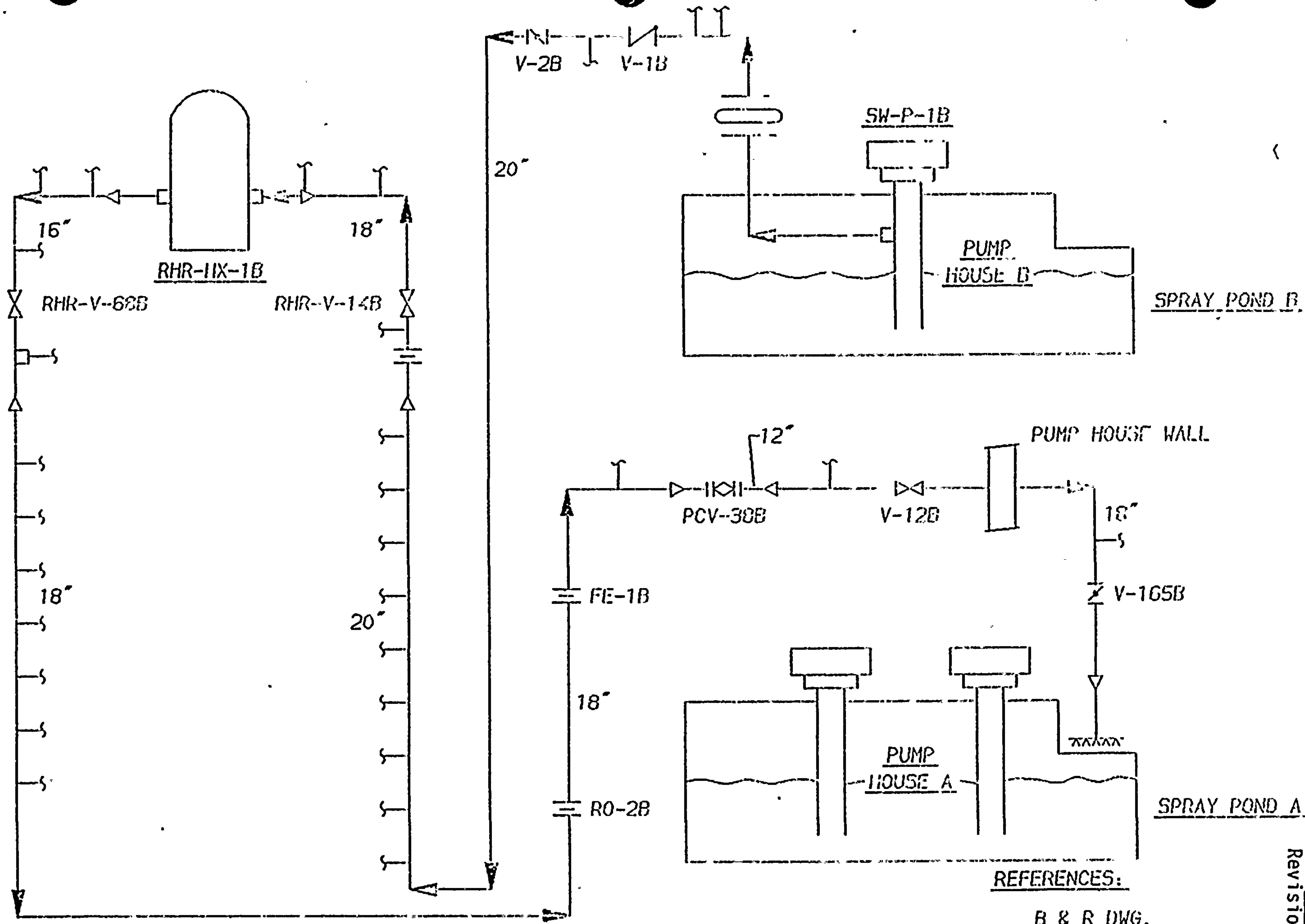
1 1/2"
SLC-P-1A
V-3A
V-33A
3"
1 1/2"
3"
4"
V-2A
1 1/2"
SLC-P-1B
V-3B
V-33B
REFERENCES:
B & R DWG.
M522
3"
4"
V-1B
STANDBY LIQUID CONTROL



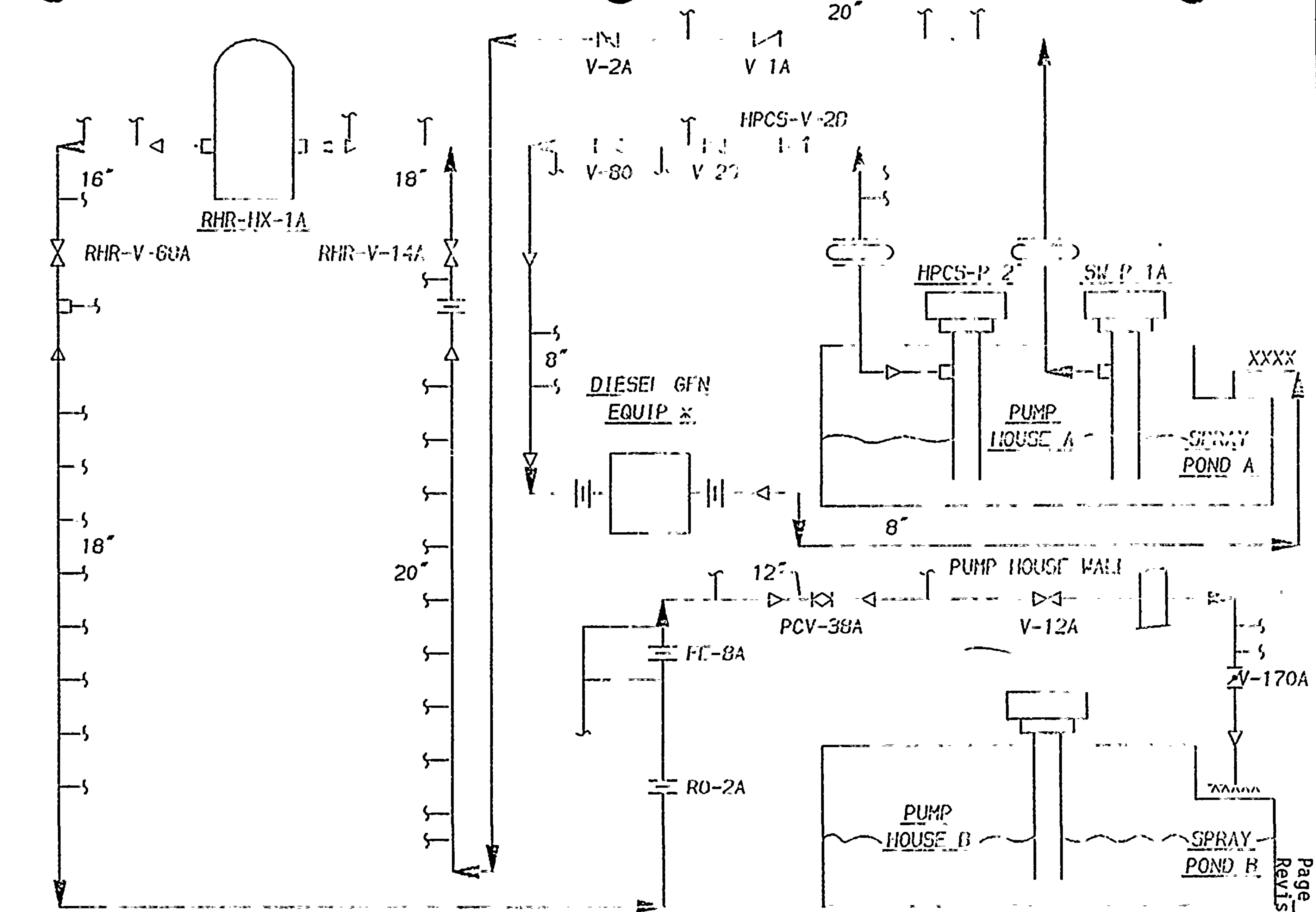
SERVICE WATER

REFERENCES:

B & R DWG.

M524

P&VF



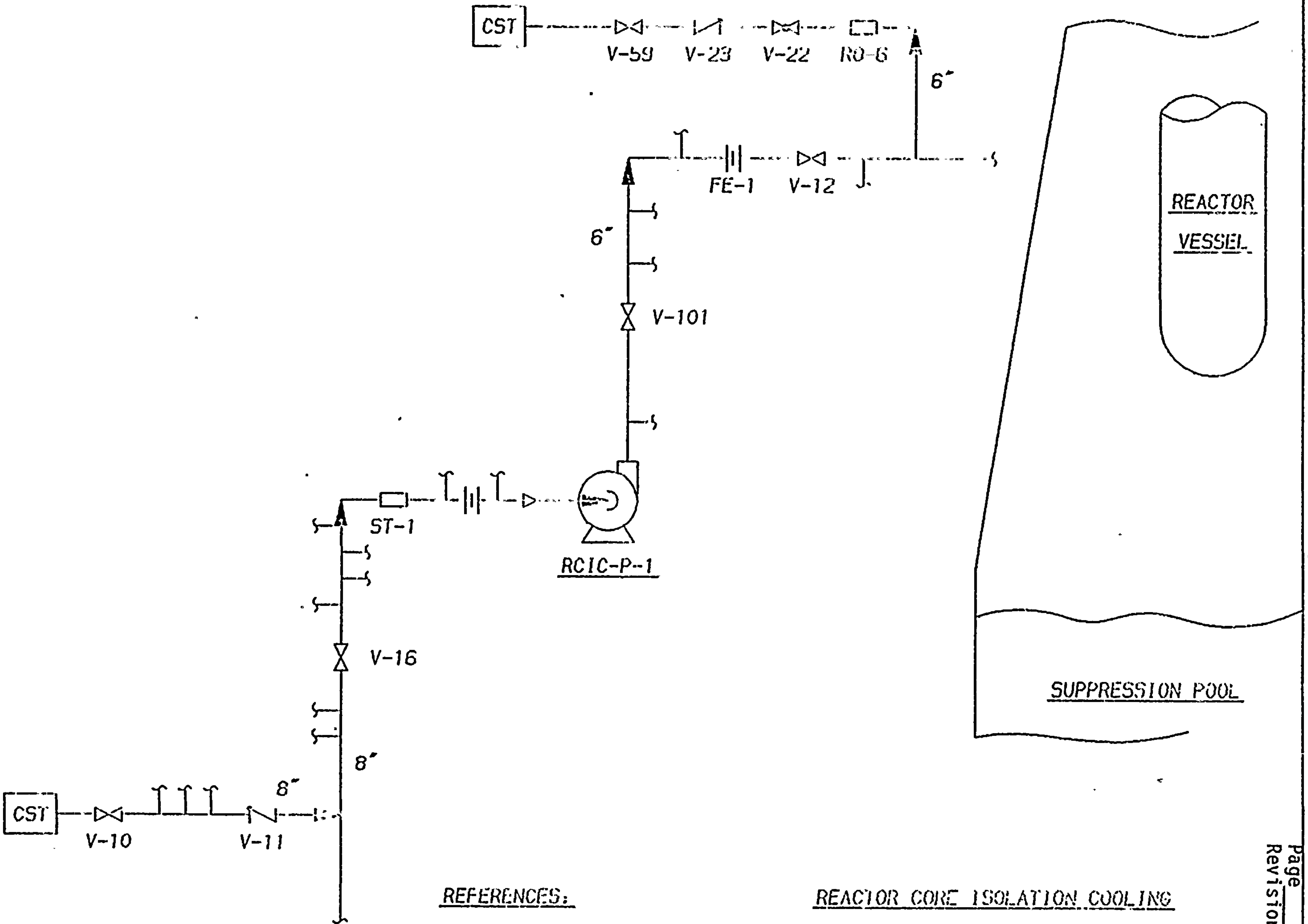
REFERENCES:

B & R DWG

M524

* INDIVIDUAL FLOW INDICATORS

SERVICE WATER

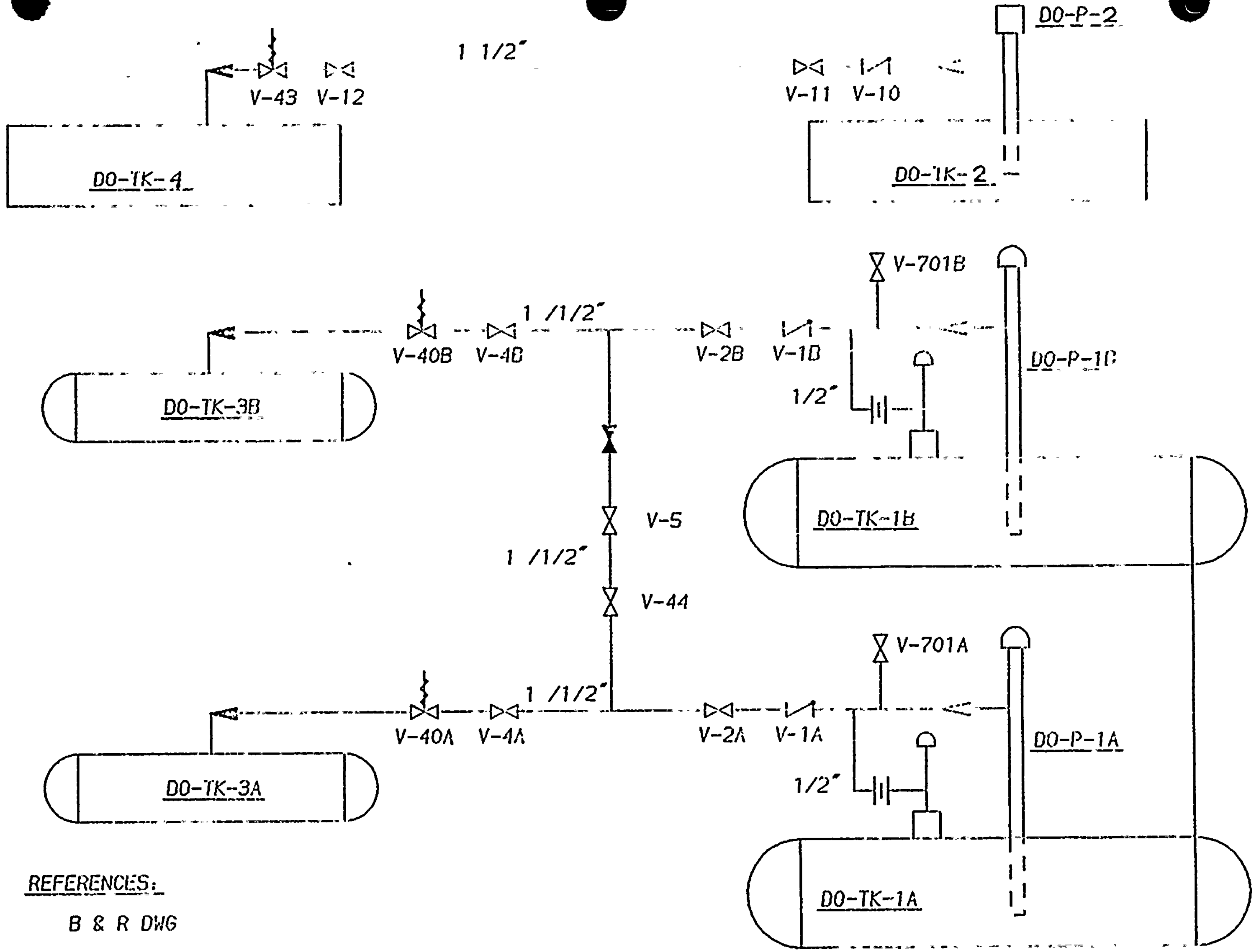


REFERENCES:

B & R DWG

M519

REACTOR CORE ISOLATION COOLING



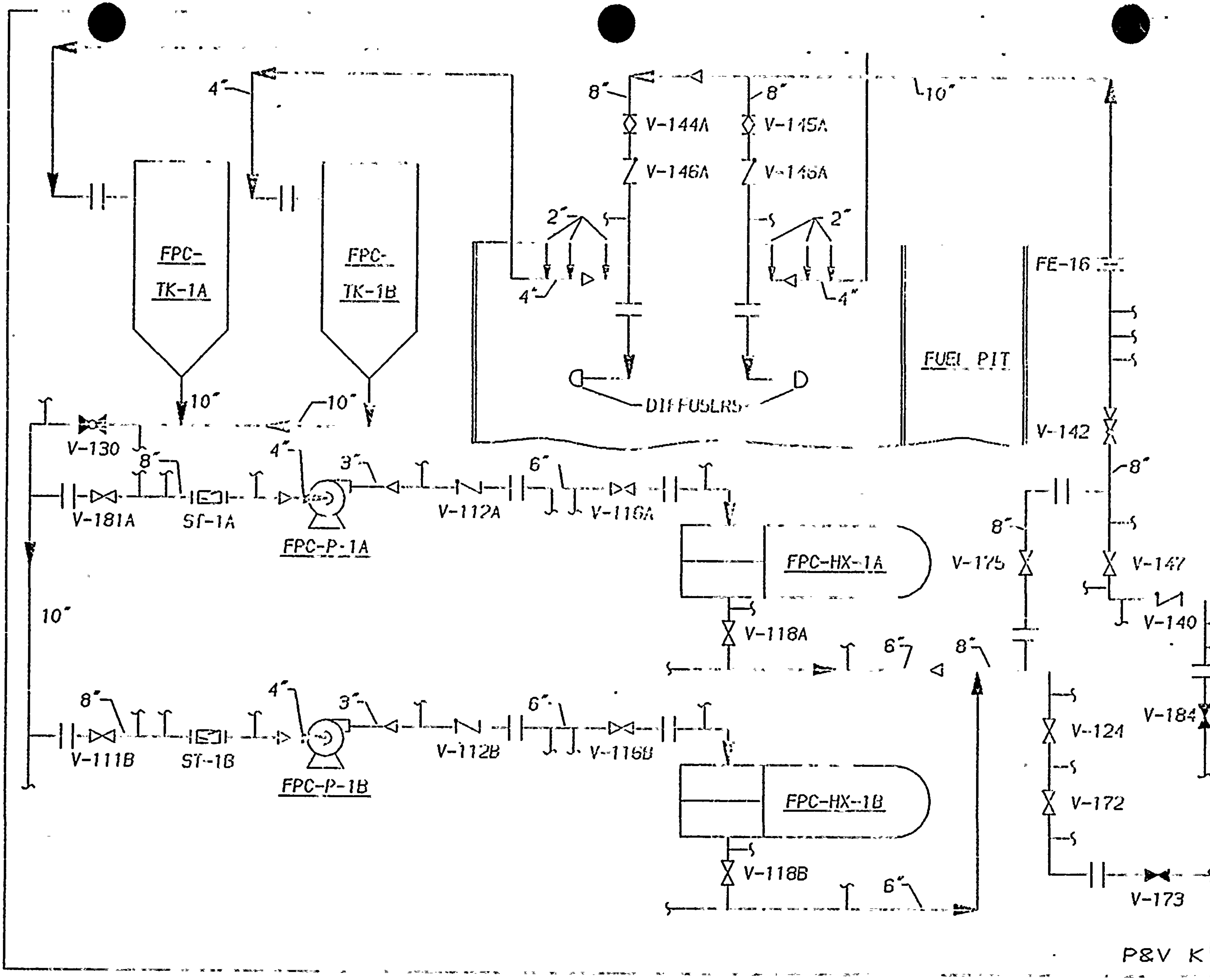
REFERENCES:

B & R DWG

M512

DIESEL FUEL OIL

P&VJ


FPC-TK-1A
FPC-TK-1B
V-144A
V-145A
V-146A
DIFFUSERS
FUEL PIT
FE-16
V-142
V-130
V-181A
ST-1A
FPC-P-1A
V-112A
V-116A
FPC-HX-1A
V-175
V-147
V-140
V-118A
V-184
V-111B
ST-1B
FPC-P-1B
V-112B
V-116B
FPC-HX-1B
V-124
V-172
V-118B
V-173
P&V K

3.8 Records of Inservice Tests

Records of Pump Inservice Test results will be maintained in accordance with Article IWP-6000 of the Code. A file will be established for each pump and will include:

1) Pump identification by equipment piece number, manufacturer, and serial number.

2) Inservice test plans. This may be by reference to the surveillance test procedure by which the pump is tested.

3) Summaries of corrective action.

The Pump Inservice Test Program, associated surveillance test procedures and results will be kept at the WNP-2 plant site. For informational purposes, a sample pump test data sheet is provided.

SAMPLE PUMP TEST DATA SHEET

Pump ID ______________________ Date ______________________

Parameters		Action* Range	Alert* Range	Measured Value	Init.
Pump Suction Press (Before Pump Start)	(PI) (Calib. Due Date)	N/A	N/A	psig	
Pump Suction Press (During Test)	(PI) (Calib. Due Date)	N/A	N/A	psig	
Pump Discharge Press	(PI) (Calib. Due Date)	N/A	N/A	psig	
Calculated Pump $\triangle$ P (line 3 - line 4)		psiD	psiD	psiD	
System Flow	(FI)** (Calib. Due Date)	gpm	gpm	gpm	
Pump Bearing Vibration (See Reverse Side)					

Lubrication Level or Pressure Satisfactory_____ Unsatisfactory_____

COMMENTS: ____

____

____

* If deviations fall within the ALERT RANGE, the test frequency is increased to once each 45 days. If deviations fall within the ACTION RANGE, the pump shall be declared inoperable and the deviation investigated and/or corrected.

** Where flow is calculated rather than measured, record identification numbers and calibration due date of instruments used to collect data (e.g., level indicator, stopwatch).

PUMP VIBRATION DATA

TEST EQUIPMENT USED

Calibration Due Date

OPERATING CONDITIONS

Drive Equipment

Volts____ Amps_____ RPM_____
Temp. Outbd. Bear.____°
Inbd. Bear.____°

Driven Equipment

Sys. Temp._____°
Temp. Outbd. Bear.____°
Inbd. Bear.____°

EQUIPMENT SKETCH

Legend:
Pickup Point
Bearing
Coupling

Performed by Date

Verified by Date

Alert Range: Vel. > .157 in/sec
Action Range: Vel. ≥.314 in/sec

PICKUP		FILTER OUT								
		DISPL.		VELOCITY						
POINT	POS.	MILS	CPM	IN/SEC	CPM					
	H									
	V									
	A									
	H									
	V									
	A									
	H									
	V									
	A									
	H									
	V									
	A									
	H									
	V									
	A									
	H									
	V									

4.0 WNP-2 Valve Inservice Test Program

4.1 Program Development Philosophy

Washington Public Power Supply System Nuclear Project Unit 2 (WNP-2) is a Boiling Water Reactor being constructed in compliance with the ASME Boiler and Pressure Vessel Code. The Code requires periodic testing of certain safety related valves in order to verify their operability and physical integrity. The WNP-2 Valve Inservice Test Program satisfies these requirements and conforms to FSAR commitments for valve testing.

The Program will detect potentially adverse changes in the mechanical condition of valves within the scope of Section XI, Subsection IWV of the Code. The scope includes all valves "which are required to perform a specific function in shutting down a reactor to the cold shutdown condition <u>or</u> in mitigating the consequences of an accident". Mary valves used in normal shutdown operations are not necessarily "required" nor would they necessarily be available for that purpose. Hence, the scope of IWV is restricted to valves required to shutdown the reactor in emergency situations and to mitigate accident consequences.

To generate the WNP-2 Program, all ASME Class 1, 2 and 3 valves were analyzed to determine the required type and frequency of testing for each valve. The valves to be tested under Section XI, Subsection IWV commitments are listed, by system, in the Valve Test Tables (Section 4.4). The Tables schedule only valve exercise tests. Leak rate testing mandated by Section XI will be incorporated into a WNP-2 unified leak rate testing program which will satisfy Section XI and other requirements.

The WNP-2 FSAR commits to meeting the requirements of both 10 CFR 50, Appendix J[1], and of Section XI. Each of these documents addresses particular but slightly different concerns with respect to valve leakage. Each contains guidance for valve leak rate testing. Appendix J is primarily concerned with leakage out of containment subsequent to a Loss-of-Coolant Accident (LOCA). It requires leak rate testing of containment isolation valves at the maximum differential pressure (ΔP) expected during an accident. Section XI requires leak rate testing of all valves for which seat leakage "is limited to a specific maximum amount" and that testing be performed at the valves' operating ΔP unless

(1) Title 10, Code of Federal Regulations, Part 50, Appendix J. "Primary Reactor Containment Leakage Testing for Water - Cooled Power Reactors."

a lower ΔP can be shown to give conservative results. Operating ΔP may be many times the maximum post-LOCA ΔP. Finally, plant Technical Specifications also address leak rate testing and impose specific testing requirements (e.g. excess flow check valve operability demonstration; test ΔP for drywell-wetwell downcomer vacuum breakers).

The testing requirements imposed by the various sources are not identical nor are they mutually exclusive. It is anticipated that Appendix J testing may satisfy Section XI leak rate testing in some instances. However, some valves may require both Appendix J and Section XI testing. Section 4.6 identifies valves which, under the scope of Section XI, Subsection IWV, are subject to leak rate testing beyond Appendix J requirements. Relief valves are not required to be leak rate tested (IWV-3512) subsequent to bench testing and are not included in Section 4.6. Normally closed, manually operated containment isolation valves are excluded since these valves are subject only to Appendix J testing. For implementation purposes, the test frequencies mandated in Appendix J, Section XI and the Technical Specifications are the same. Leak rate testing will, in general, be performed during outages although some valves may be amenable to leak testing during power operations.

Similar testing frequencies and overlapping requirements necessitates a unified leak rate testing program which will maximize compliance with the various commitments, provide consistancy in test methodology and reduce duplication of effort. The Supply System is actively developing a unified program which will be submitted for review at a later date. Procedures to implement this program are being prepared.

Verification that position indication agrees with actual valve position will be accomplished biannually as part of the valve exercise tests. Although the tables in Section 4.4 specifically designate position indication verification only for certain manually operated valves and check valves, the position indication for power operated valves will be checked biannually during an exercise test.

The Code recognized that certain of its requirements may be impractical for a specific plant and contains provisions for requesting relief from impractical requirements. The relief requests for the Valve Inservice Test Program (Section 4.5) identify testing impracticalities, provide technical basis for the request and propose alternate testing where warranted. Most of the requests ask only for the postponement of testing, not cancellation.

The Supply System is confident that the WNP-2 Valve Inservice Test Program complies with the intent of all applicable codes, regulations,[2] and guidelines[3] and that it will make a positive contribution to the safe operation of the plant.

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(2) 10CFR 50:55 a(g)(2)

(3) NRC Staff guidelines for excluding exercising (cycling) tests of certain valves during Plant operations.

4.2 Program Implementation

The Valve Test Program will be executed as part of the normal plant surveillance routine. Two types of tests will be conducted as part of the Valve Test Program:

1) Valve Operability Tests
2) Valve Leak Rate Tests

The Operability Tests will verify 1) the valve responds to control commands, 2) the valve stroke time is within specific limits and, 3) remote position indication accurately reflects the observed valve position. Base line data for stroke times will be obtained from initial Valve Operability Tests. The initial Valve Operability Tests will meet the requirements for preservice testing (IWV-3100). Where applicable, acceptance criteria for initial stroke times will be within the limits specified in Table 6.2-16 of the WNP-2 FSAR. Otherwise, the Supply System will specify acceptable times. When these times are established, they will be inserted in the Valve Test Tables under the Stroke Time column.

Remote valve position indication will be verified every two years. Manually operated valves with remote position indication have been included in this program.

Fail safe valves will be tested by observing the valve operation upon loss of electrical, pneumatic or hydraulic actuating power. In most cases, loss of electrical power causes loss of actuating fluid and can be accomplished using normal control circuits.

Valve leak rate baseline data will be obtained in accordance with IWV-3100 and accepted industry practice. Leak rate acceptance criteria will be specified by the Owner.

4.3 Program Administration

The Valve Inservice Test Program will be administered in a manner analogous to the Pump Inservice Test Program.

4.4 Valve Test Tables

The Valve Test Tables are the essence of the Supply System's Program to meet ASME Section XI, Subsection IWV requirements. The Tables reflect the positions taken in support of the relief requests. To aid the reader in the interpretation of the Tables, brief explanations of the Table headings and abbreviations are provided.

(1) <u>Valve Number</u>	Each piece of equipment in the plant has a unique "tag" number which identifies the system to which the equipment belongs, the type of equipment (flow control valve = FCV, relief valve = RV, rupture disc = RD, etc.), and a unique serial number.
(2) <u>Class</u>	ASME Code Class per Section III of the ASME Boiler and Pressure Vessel Code. These are roughly equivalent to the safety classes defined in Chapter 3 of the FSAR.
(3) Coordinates	The specific coordinates of each valve are supplied to facilitate location of the valves on the flow diagram provided.
(4) Valve Category	Categories are defined by ASME Section XI, subsection IWV. Each valve has specific testing requirements which are determined by the category to which it belongs.
(5) <u>Size</u>	Nominal pipe diameter to which the valve connects is given in inches.
(6) <u>Valve Type</u>	The following abbreviations are used to describe valve type:

BF = Butterfly valve	GT = Gate Valve
CK = Check valve	RD = Rupture disc.
DIA = Diaphragm valve	RV = Relief Valve
GB = Globe valve	S/R = Safety/Relief Valve
	SV = Solenoid Valve

(7) Actuator Type

The following abbreviations are used to describe actuator types. Valves may be actuated in more than one way.

AO = Air operated
HO = Hydraulic operated
MAN = Manually operated
MO = Motor operated
SA = Self actuated (actuated by a change in system parameters such as flow or pressure, e.g., check and relief valves).
SOL = Solenoid operated

(8) Normal Position

Valves may be either normally open (O) or normally closed (C). Throttle valves are not included in the scope of this program since they are either passive or regulating type valves. Both types of valves are exempt from IWV testing (IWV-2100).

(9) Test During

This column defines the operating modes as defined by the Technical Specifications, during which the valve may be safely tested. See below for the definition of "all," "CSD" and "Refuel."

Legend	Meaning
All	Testing is approved during all operating modes and will be conducted on a quarterly basis, as permitted by plant status.

CSD	Cold shutdown. Guidance for Inservice valve testing at cold shutdown is: Valve testing should commence not later than 48 hours after cold shutdown is achieved and continue until complete or until plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one cold shutdown should be performed during the subsequent cold shutdowns to meet the Code specified testing frequency.
Refuel	Test will be conducted during refueling outages but at least every two years. Certain work which is nominally scheduled for a refueling outage may be performed at other times when plant conditions permit. The two year minimum frequency will be maintained.
IWV-3620	Test frequency will be according to vendor specifications.
(10) <u>Test</u>	Testing requirements identified for the valve are identified here.
S/E	Stroke exercise; valve timing not relevant.

S/T	Stroke time; valve must meet stroke timing requirements specified in the FSAR or elsewhere.
Bench Test	Relief valves will be tested in accordance with IWV-3500 requirements.
IWV-3620	Rupture disc will be tested in accordance with Section XI, Subsection IWV, paragraph 3620.
Pos Ind	Position Indication verification only. Used only for manual valves. Power operated valves' position indication will be verified biannually during exercise test.
(11) Stroke Time	Reference stroke time will be listed where ( ) appears. Values will be determined during initial surveillance testing and will comply with limiting values of full stroke time specified in the FSAR, Technical Specifications or other commitment documents
(12) Notes	Generally self explanatory, e.g., NO = Normally open FO = Fails open NC = Normally closed FC = Fails closed
(13) Requests for Relief	Cross references documentation which requests waiver of certain code requirements. A valve may have more than one associated relief request.

System Name CONTROL AND SERVICE AIR Dwg. No. M510

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
CAS-V-453	2	K8	X				1	SV	SOL	C	ALL	S/E	N/A		1
CAS-CVX--82e	2	K8		X	X		1	CK	SA	C	ALL	S/E	N/A		

System Name DIESEL OIL AND MISC. (DO) Dwg. No. M 512

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
DO-V-1A	3	D3		X	X		1 1/2	CK	SA	C	ALL	S/E	N/A		
DO-V-1B	3	D3		X	X		1 1/2	CK	SA	C	ALL	S/E	N/A		
DO-V-1D	3	H5		X	X		1 1/2	CK	SA	C	ALL	S/E	N/A		
DO-V-40A	3	E3		X			1 1/2	SV	SOL	C	ALL	S/E	N/A		
DO-V-40B	3	E3		X			1 1/2	SV	SOL	C	ALL	S/E	N/A		
DO-V-43	3	H6		X			1 1/2	SV	SOL	C	ALL	S/E	N/A		

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RCIC-V-1	2	E11		X			3	GT	MO	O	ALL	S/E	N/A	Rapid Acting	
RCIC-V-8	1	F6	X				4	GT	MO	O	ALL*	S/T	( )		
RCIC-V-10	2	B14		X			8	GT	MO	O	ALL	S/T	(NA)		
RCIC-V-11	2	B13		X	X		8	CK	SA	C	ALL	S/E	N/A		
RCIC-V-13	1	H7	X				6	GT	MO	C	ALL	S/T	( )		
RCIC-V-19	2	E7	X				2	GB	MO	C	ALL	S/T	( )		
RCIC-V-19B	2	J6	X				1/2	GT	AO	O	ALL	S/T	( )		
RCIC-V-21	2	E8		X	X		2	CK	SA	C	ALL	S/E	N/A		
RCIC-V-22	2	J8		X			6	GB	MO	C	ALL	S/T	( )		
RCIC-V-28	2	D8		X	X		1 1/2	CK	SA	C	ALL	S/T	N/A		
RCIC-V-30	2	C7		X	X		8	CK	SA	C	ALL	S/E	N/A		
RCIC-V-31	2	C7	X				8	GT	MO	C	ALL	S/T	( )		
RCIC-V-40	2	D8	X		X		10	CK	SA	C	ALL	S/E	N/A		
RCIC-V-45	2	F11		X			4	GB	MO	C	ALL*	S/T	( )		
RCIC-V-46	2	F11		X			2	GB	MO	C	ALL	S/T	( )		
RCIC-V-59	2	J9		X			6	GT	MO	C	ALL	S/T	( )		

* Valves marked with an ASTERISK (*) close automatically if Reactor Vessel Pressure is less than 47 psig. Therefore, if Cold Shutdown conditions extend beyond a 3 month period, IWV testing frequency may not be met. However, valves will be tested prior to resuming power operations (IWV-3416)

System Name REACTOR CORE ISOLATION COOLING (RCIC) Dwg. No. M 519

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RCIC-V-63	1	H3	X				10	GT	MO	O	ALL*	S/T	( )		
RCIC-V-64	1	G6	X				10	GT	MO	C	ALL*	S/T	( )		
RCIC-V-65	1	H6		X	X		6	CK	AO/SA	C	ALL	S/E	N/A		
RCIC-V-66	1	J4	X		X		6	CK	AO/SA	C	CSD	S/E	N/A		2
RCIC-V-68	2	E7	X				10	GT	MO	O	ALL	S/T	( )		
RCIC-V-69	2	D7	X				1-1/2	GT	MO	O	ALL	S/T	( )		
RCIC-V-76	1	H3	X				1	GB	MO	C	ALL*	S/T	( )		
RCIC-V-086	2	A13		X	X		2	CK	SA	C	ALL	S			
RCIC-V-110	2	E7	X				2	GT	MO	O	ALL*	S/T	( )		
RCIC-V-113	2	E6	X				2	GT	MO	O	ALL*	S/T	( )		
RCIC-RD-1	2	D11				X	10	RUPTURE DISC	SA	C	IWV-3620	IWV-3620	N/A		
RCIC-RD-2	2	C12				X	10	RUPTURE DISC	SA	C	IWV-3620	IWV-3620	N/A		
RCIC-RV-17	2	C13			X		1 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		
RCIC-RV-18	2	D9			X		3/4 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		

* See note on RCIC System page 1 of 2.

System Name LOW PRESSURE CORE SPRAY SYSTEM (LPCS) Dwg. No. M520 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
LPCS-V-1	2	D11	X				24	GT	MO	O	ALL	S/T	( )		
LPCS-V-3	2	B13		X	X		16	CK	SA	C	ALL	S/E	N/A		
LPCS-V-5	1	G11	X				12	GT	MO	C	ALL	S/T	( )		
LPCS-V-6	1	H9	X		X		12	CK	AO	C	CSD	S/E	N/A		2
LPCS-V-12	2	F14	X				12	GB	MO	C	ALL	S/T	( )		
LPCS-V-33	2	C12		X	X		1 1/2	CK	SA	O	ALL	S/E	N/A		
LPCS-V-51	1	H9		X			12	GT	MAN	O	REFUEL	POS IND	N/A		
LPCS-FCV-11	2	B13	X				3	GB	MO	C	ALL	S/T	( )		
LPCS-RV-18	2	F12			X		1 1/2 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
LPCS-RV-31	2	C12			X		1	RV	SA	C	REFUEL	BENCH TEST	N/A		

System Name HIGH PRESSURE CORE SPRAY SYSTEM (HPCS) Dwg. No. M520 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
HPCS-V-1	2	C6		X			14	GT	MO	O	ALL	S/T	( )		
HPCS-V-2	2	C6		X	X		20	CK	SA	C	ALL	S/E	N/A		
HPCS-V-4	1	G7	X				12	GT	MO	C	ALL	S/T	( )		
HPCS-V-5	1	H8	X		X		12	CK	AO	C	CSO	S/E	N/A		2
HPCS-V-7	2	C5		X	X		1 1/2	CK	SA	O	ALL	S/E	N/A		
HPCS-V-10	2	E3		X			10	GB	MO	C	ALL	S/T	( )		
HPCS-V-11	2	E3		X			10	GB	MO	C	ALL	S/T	( )		
HPCS-V-12	2	B5	X				4	GT	MO	C	ALL	S/T	( )		
HPCS-V-15	2	D7	X				18	GT	MO	C	ALL	S/T	( )		
HPCS-V-16	2	E6		X	X		24	CK	SA	C	ALL	S/E	N/A		
HPCS-V-23	2	E4	X				12	GB	MO	C	ALL	S/T	( )		
HPCS-V-24	2	B5		X	X		16	CK	SA	C	ALL	S/E	N/A		
HPCS-V-28	3	M524 Rev. 19 J5		X	X		8	CK	SA	C	ALL	S/E	N/A		
HPCS-V-51	1	H8		X			12	GT	Man	O	REFUEL	POS IND	N/A		
HPCS-RV-14	2	C6			X		1X1	RV	SA	C	REFUEL	BENCH TEST	N/A		
HPCS-RV-35	2	C4			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RHR-V-3A	2	J13		X			18	GT	MO	O	ALL	S/T	( )		
RHR-V-3B	2	J4		X			18	GT	MO	O	ALL	S/T	( )		
RHR-V-4A	2	E11	X				24	GT	MO	O	ALL	S/T	( )		
RHR-V-4B	2	D6	X				24	GT	MO	O	ALL	S/T	( )		
RHR-V-4C	2	D11	X				24	GT	MO	O	ALL	S/T	( )		
RHR-V-6A	2	C12		X			18	GT	MO	C	ALL	S/T	( )		
RHR-V-6B	2	C6		X			18	GT	MO	C	ALL	S/T	( )		
RHR-V-8	1	F11	X				20	GT	MO	C	CSD	S/T	( )		11
RHR-V-9	1	F10	X				20	GT	MO	C	CSD	S/T	( )		11
RHR-V-11A	2	F12	X				4	GT	MO	C	ALL	S/T	( )		
RHR-V-11B	2	E7	X				4	GT	MO	C	ALL	S/T	( )		
RHR-V-16A	2	H11	X				16	GT	MO	C	ALL	S/T	( )		
RHR-V-16B	2	F6	X				16	GT	MO	C	ALL	S/T	( )		
RHR-V-17A	2	H10	X				16	GT	MO	C	ALL	S/T	( )		
RHR-V-17B	2	F6	X				16	GT	MO	C	ALL	S/T	( )		

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RHR-V-21	2	E11	X				18	GB	MO	C	ALL	S/T	( )		
RHR-V-23	1	H7	X				6	GB	MO	C	CSD	S/T	( )		11
RHR-V-24A	2	E12	X				18	GB	MO	C	ALL	S/T	( )		
RHR-V-24B	2	E6	X				18	GB	MO	C	ALL	S/T	( )		
RHR-V-27A	2	E11	X				6	GT	MO	C	ALL	S/T	( )		
RHR-V-27B	2	E7	X				6	GT	MO	C	ALL	S/T	( )		
RHR-V-31A	2	B13		X	X		18	CK	SA	C	ALL	S/E	N/A		
RHR-V-31B	2	B4		X	X		18	CK	SA	C	ALL	S/E	N/A		
RHR-V-31C	2	B7		X	X		18	CK	SA	C	ALL	S/E	N/A		
RHR-V-40	2	G4		X			4	GB	MO	C	ALL	S/T	( )		
RHR-V-41A	1	G10	X		X		14	CK	AO	C	CSD	S/E	N/A		2
RHR-V-41B	1	G8	X		X		14	CK	AO	C	CSD	S/E	N/A		2
RHR-V-41C	1	G10	X		X		14	CK	AO	C	CSD	S/E	N/A		2
RHR-V-42A	1	G11	X				14	GT	MO	C	ALL	S/T	( )		

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RHR-V-42B	1	G7	X				14	GT	MO	C	ALL	S/T	( )		
RHR-V-42C	1	G11	X				14	GT	MO	C	ALL	S/T	( )		
RHR-V-46A	2	D12	X		X		6	CK	SA	C	ALL	S/E	N/A		
RHR-V-46B	2	E6	X		X		6	CK	SA	C	ALL	S/E	N/A		
RHR-V-46C	2	D11	X		X		6	CK	SA	C	ALL	S/E	N/A		
RHR-V-47A	2	J14		X			18	GT	MO	O	ALL	S/T	( )		
RHR-V-47B	2	J3		X			18	GT	MO	O	ALL	S/T	( )		
RHR-V-48A	2	J13		X			18	GB	MO	O	ALL	S/T	( )		
RHR-V-48B	2	J5		X			18	GB	MO	O	ALL	S/T	( )		
RHR-V-49	2	G4		X			4	GT	MO	C	ALL	S/T	( )		
RHR-V-50A	1	G10	X		X		12	CK	AO	C	CSD	S/E	N/A		2
RHR-V-50B	1	G8	X		X		12	CK	AO	C	CSD	S/E	N/A		2
RHR-V-53A	1	G11	X				12	GB	MO	C	CSD	S/T	( )		11
RHR-V-53B	1	G7	X				12	GB	MO	C	CSD	S/T	( )		11

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RHR-V-60A	2	H12		X			3/4	SV	SOL	C	ALL	S/E	N/A		1
RHR-V-60B	2	J5		X			3/4	SV	SOL	C	ALL	S/E	N/A		1
RHR-V-68A	3	M524 REV. 19 H12			X		16	GT	MO	O	ALL	S/T	( )		
RHR-V-68B	3	M524 REV 19 H11		X			16	GT	MO	O	ALL	S/T	( )		
RHR-V-75A	2	H12		X			3/4	SV	SOL	C	ALL	S/E	N/A		
RHR-V-75B	2	J5		X			3/4	SV	SOL	C	ALL	S/E	N/A		
RHR-V-84A	2	B13		X	X		1 1/2	CK	SA	C	ALL	S/E	N/A		
RHR-V-84B	2	B7		X	X		1 1/2	CK	SA	C	ALL	S/E	N/A		
RHR-V-84C	2	B4		X	X		1 1/2	CK	SA	C	ALL	S/E	N/A		
RHR-V-89	2	J6		X	X		14	CK	AO	C	ALL	S/E	N/A		
RHR-V-101A	2	F14	X		X		2	CK	SA	C	ALL	S/E	N/A		
RHR-V-101B	2	F4	X		X		2	CK	SA	C	ALL	S/E	N/A		
RHR-V-103A	2	F14	X		X		2	CK	SA	C	ALL	S/E	N/A		
RHR-V-103B	2	F4	X		X		2	CK	SA	C	ALL	S/E	N/A		

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RHR-V-111A	1	G9		X			14	GT	MAN	O	REFUEL	POS IND	N/A		
RHR-V-111B	1	G8		X			14	GT	MAN	O	REFUEL	POS IND	N/A		
RHR-V-111C	1	G9		X			14	GT	MAN	O	REFUEL	POS IND	N/A		
RHR-V-112A	1	G9		X			12	GT	MAN	O	REFUEL	POS IND	N/A		
RHR-V-112B	1	G8		X			12	GT	MAN	O	REFUEL	POS IND	N/A		
RHR-V-113	1	G9		X			20	GT	MAN	O	REFUEL	POS IND	N/A		
RHR-V-115	2	J6		X			14	GT	MO	C	ALL	S/T	( )		
RHR-V-116	2	J6		X			14	GT	MO	C	ALL	S/T	( )		
RHR-V-124A	2	D14	X				1-1/2	GB	MO	C	ALL	S/T	( )		
RHR-V-124B	2	D14	X				1-1/2	GB	MO	C	ALL	S/T	( )		
RHR-V-125A	2	D4	X				1-1/2	GB	MO	C	ALL	S/T	( )		
RHR-V-125B	2	D4	X				1-1/2	GT	MO	C	ALL	S/T	( )		
RHR-V-134A	2	G15	X				2	GB	MO	C	ALL	S/T	( )		
RHR-V-134B	2	F2	X				2	GB	MO	C	ALL	S/T	( )		
RHR-V-182	2	J6		X			3/4	SV	SOL	O	ALL	S/E	N/A		1
RHR-V-209	1	F10	X		X		3/4	CK	SA	C	REFUEL	S/E	N/A		2

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RHR-FCV-64A	2	C12	X				3	GB	MO	O	ALL	S/T	( )		
RHR-FCV-64B	2	C5	X				3	GB	MO	O	ALL	S/T	( )		
RHR-FCV-64C	2	C8	X				3	GB	MO	O	ALL	S/T	( )		
RHR-RV-1A	2	J14			X		3/4 x 1 1/2	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-1B	2	J3			X		3/4 x 1 1/2	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-5	2	C11			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-25A	2	F12			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-25B	2	F6			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-25C	2	E11			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-30	2	A7			X		3/4 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-36	2	G13			X		6 x 8	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-88A	2	E11			X		3/4 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-88B	2	E6			X		3/4 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		
RHR-RV-88C	2	C11			X		3/4 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		

System Name STANDBY LIQUID CONTROL (SLC) Dwg. No. M522 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
SLC-V-1A	2	E4		X			4	GB	MO	C	ALL	S/T	( )		
SLC-V-1B	2	D4		X			4	GB	MO	C	ALL	S/T	( )		
SLC-V-4A	1	F8				X	1-1/2	SHEAR PLUG	SQUIBB	C	REFUEL	IWV 3610	N/A		
SLC-V-4B	1	D8				X	1-1/2	SHEAR PLUG	SQUIBB	C	REFUEL	IWV 3610	N/A		
SLC-V-6	1	F11	X		X		1-1/2	CK	SA	C	REFUEL	S/E	N/A		4
SLC-V-7	1	F13	X		X		1-1/2	CK	SA	C	REFUEL	S/E	N/A		4
SLC-V-8	1	F12		X			1-1/2	GT	MAN	O	REFUEL	POS IND	N/A		
SLC-V-33A	2	F7		X	X		1-1/2	CK	SA	C	ALL	S/E	N/A		
SLC-V-33B	2	D7		X	X		1-1/2	CK	SA	C	ALL	S/E	N/A		
SLC-RV-29A	2	E6			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
SLC-RV-29B	2	D6			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		

System Name REACTOR WATER CLEANUP (RWCU) Dwg. No. M523 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RWCU-V-1	1	F15	X				6	GT	MO	0	ALL	S/T	( )		
RWCU-V-4	1	E15	X				6	GT	MO	0	ALL	S/T	( )		
RWCU-V-40	1	H11	X				6	GT	MO	0	ALL	S/T	( )		

System Name STANDBY SERVICE WATER (SW) Dwg. No. M524

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
SW-V-1A	3	Sh 1 H5		X	X		20	CK	SA	C	ALL	S/E	N/A		
SW-V-1B	3	Sh 2 G5		X	X		20	CK	SA	C	ALL	S/E	N/A		
SW-V-2A	3	Sh 1 H6		X			20	BF	MO	C	ALL	S/T	( )		
SW-V-2B	3	Sh 2 G6		X			20	BF	MO	C	ALL	S/T	( )		
SW-V-4A	3	Sh 1 E9		X			8	GT	MO	O	ALL	S/T	( )		
SW-V-4B	3	Sh 2 G9		X			8	GT	MO	O	ALL	S/T	( )		
SW-V-4C	3	Sh 1 F7		X			8	GT	MO	O	ALL	S/T	( )		
SW-V-12A	3	Sh 1 G3		X			18	GT	MO	C	ALL	S/T	( )		
SW-V-12B	3	Sh 2 G3		X			18	GT	MO	C	ALL	S/T	( )		
SW-V-24A	3	Sh 1 G9		X			2	GT	MO	O	ALL	S/T	( )		
SW-V-24B	3	Sh 2 F10		X			2	GT	MO	O	ALL	S/T	( )		
SW-V-24C	3	Sh 2 K10		X			2	GT	MO	O	ALL	S/T	( )		
SW-V-29	3	Sh 1 G6		X			8	BF	MO	C	ALL	S/T	( )		
SW-V-34	3	Sh 2 C11		X			1 1/2	GB	SV	O	ALL	S/T	( )		
SW-V-44	3	Sh 1 E9		X			2	GT	MO	O	ALL	S/T	( )		
SW-V-54	3	Sh 1 F7		X			2	GT	MO	C	ALL	S/T	( )		

System Name STANDBY SERVICE WATER (SW) Dwg. No. M524 M607

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
SW-V-69A	3	Sh 1 G3		X			18	GT	MO	0	ALL	S/T	( )		
SW-V-69B	3	Sh 2 F3		X			18	GT	MO	0	ALL	S/T	( )		
SW-V-70A	3	Sh 1 G2		X			18	GT	MO	0	ALL	S/T	( )		
SW-V-70B	3	Sh 2 F3		X			18	GT	MO	0	ALL	S/T	( )		
SW-V-90	3	Sh 2 H8		X			2	GT	MO	C	ALL	S/T	( )		
SW-V-92	3	Sh 2 H9		X	X		2	CK	SA	C	ALL	S/E	N/A		
SW-V-201	3	Dwg M607, Sh 2 C14		X			1/2	SV	SOL	C	ALL	S/E	N/A		1
SW-V-202	3	Dwg M607, Sh 2 C14		X			1/2	CK	SA	C	ALL	S/E	N/A		
SW-V-203	3	Dwg M607, Sh 2 C14		X			1/2	CK	SA	0	ALL	S/E	N/A		
SW-V-204	3	Dwg M607, Sh 2 C14		X			1/2	SV	SOL	0	ALL	S/E	N/A		1
SW-V-206	3	Dwg M607, Sh 2 B15		X			1/2	SV	SOL	C	ALL	S/E	N/A		1
SW-V-207	3	Dwg M607, Sh 2 B15		X			1/2	CK	SA	C	ALL	S/E	N/A		
SW-V-208	3	Dwg M607, Sh 2 B15		X			1/2	CK	SA	0	ALL	S/E	N/A		
SW-V-209	3	Dwg M607, Sh 2 B15		X			1/2	SV	SOL	0	ALL	S/E	N/A		1
SW-V-210	3	Dwg M607, Sh 2 A11		X			1/2	SV	SOL	0	ALL	S/E	N/A		1
SW-V-211	3	Dwg M607, Sh 2 B11		X			1/2	SV	SOL	C	ALL	S/E	N/A		1

System Name STANDBY SERVICE WATER (SH) Dwg. No. M524 M607 Page 3 of 3

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type.	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
SW-V-212	Dwg M607, Sh 2 3	A14		X			1/2	SV	SOL	O	ALL	S/E	N/A		1
SW-V-213	Dwg M607, Sh 2 3	B13		X			1/2	SV	SOL	C	ALL	S/E	N/A		1
SW-V-214	Dwg 524 3	Sh 2 G8		X			6	BF	AO	C	ALL	S/T	( )		
SW-V-215	3	Sh 2 G8		X			6	BF	AO	C	ALL	S/T	( )		
SW-V-216	3	Sh 2 H8		X			6	BF	AO	C	ALL	S/T	( )		
SW-V-217	3	Sh 2 H8		X			6	BF	AO	C	ALL	S/T	( )		
SW-V-75A	3	Sh 1 A13		X			2	GB	M	C	ALL	S/T	( )	(1)	
SW-V-75B	3	Sh 2 B14		X			2	GB	M	C	ALL	S/T	( )	(1)	
SW-V-187A	3	Sh 1 G14		X			6	GT	M	C	ALL	S/T	( )	(1)	
SW-V-187B	3	Sh 2 C13		X			6	GT	M	C	ALL	S/T	( )	(1)	
SW-V-188A	3	Sh 1 H13		X			6	GT	M	C	ALL	S/T	( )	(1)	
SW-V-188B	3	Sh 2 D12		X			6	GT	M	C	ALL	S/T	( )	(1)	

(1) These valves are not yet installed and may not be installed until the first fuel outage. Above test program will be implemented after valves are installed and operable.

System Name REACTOR CLOSED COOLING (RCC) Dwg. No. M525 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RCC-V-5	2	D10	X				10	GT	MO	0	CSD	S/T	( )		8
RCC-V-21	2	D10	X				10	GT	MO	0	CSD	S/T	( )		8
RCC-V-26	2	D11	X		X		10	CK	SA	0	CSD	S/E	N/A		8
RCC-V-40	2	D10	X				10	GT	MO	0	CSD	S/T	( )		8
RCC-V-104	2	E10	X				10	GT	MO	0	CSD	S/T	( )		8
RCC-V-129	3	E5		X			8	GT	MO	0	ALL	S/T	( )		
RCC-V-130	3	E6		X			8	GT	MO	0	ALL	S/T	( )		
RCC-V-131	3	E6		X			8	GT	MO	0	ALL	S/T	( )		

System Name FUEL POOL COOLING SYSTEM (FPC) Dwg. No. M526 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
FPC-V-112A	3	D12		X			6	CK	SA	O	ALL	S/E	N/A		
FPC-V-112B	3	D12		X			6	CK	SA	O	ALL	S/E	N/A		
FPC-V-153	2	B11	X				6	GT	MO	C	ALL	S/T	( )		
FPC-V-154	2	B11	X				6	GT	MO	C	ALL	S/T	( )		
FPC-V-156	2	C11	X				6	GT	MO	C	ALL	S/T	( )		
FPC-V-172	3	C9		X			8	GT	MO	O	ALL	S/T	( )		
FPC-V-173	3	C8		X			8	GT	MO	O	ALL	S/T	( )		
FPC-V-175	3	C9		X			8	GT	MO	C	ALL	S/T	( )		
FPC-V-181A	3	D14		X			8	GT	MO	O	ALL	S/T	( )		
FPC-V-181B	3	D14		X			8	GT	MO	O	ALL	S/T	( )		
FPC-V-184	3	C9		X			8	GT	MO	O	ALL	S/T	( )		
FPC-RV-117A	3	D11			X		3/4 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		
FPC-RV-117B	3	C11			X		3/4 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		

System Name CONTROL ROD DRIVE (CRD, HCU) Dwg. No. M528 Page 1 of 2

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
CRD-V-10	2	K6		X			1	GB	AO	O	ALL	S/T	( )		
CRD-V-11	2	F6		X			2	GB	AO	O	ALL	S/T	( )		
CRD-V-110A	2	D13		X			1-1/2	SV	SOL	N/A	CSD	S/E	N/A	Normally energized to pressurize	9
CRD-V-110B	2	D13		X			1-1/2	SV	SOL	N/A	CSD	S/E	N/A	Scram Valve diaphragms	9
CRD-V-111	2	D13		X			1-1/2	CK	SA	C	CSD	S/E	N/A		
CRD-RV-12	2	H6			X		3/4 x 1	RV	SA	C	REFUEL	BENCH	N/A		
HCU-V-114	2	C2		X	X			CK	SA	C	ALL	S/E	N/A		9
HCU-V-115	2	C5		X	X			CK	SA	C	ALL	S/E	N/A		9
HCU-V-117	2	D3		X				SV	SV	O	ALL	S/E	N/A		9
HCU-V-118	2	D3		X				SV	SV	O	ALL	S/E	N/A		9
HCU-V-120	2	C4		X				SV	SV	C	ALL	S/E	N/A	TYPICAL OF 185 CONTROL	9
HCU-V-121	2	C4		X				SV	SV	C	ALL	S/E	N/A	ROD DRIVE UNITS	9
HCU-V-122	2	C4		X				SV	SV	C	ALL	S/E	N/A		9
HCU-V-123	2	C4		X				SV	SV	C	ALL	S/E	N/A		9
HCU-V-126	2	C4		X			1	GT	AO	C	ALL	S/E	N/A		9

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
HCU-V-127	2	C3		X			1	GT	AO	C	ALL	S/E	N/A		9
HCU-V-137	2	C4		X	X			CK	SA	C	ALL	S/E	N/A		9
HCU-V-138	2	C4		X	X			CK	SA	C	ALL	S/E	N/A		9

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
MS-V-16	1	B13	X				3	GT	MO	C	ALL	S/T	( )		
MS-V-19	1	B14	X				3	GT	MO	C	ALL	S/T	( )		
MS-V-22A	1	F12	X				26	GB	AO	0	ALL	S/T	( )		
MS-V-22B	1	E12	X				26	GB	AO	0	ALL	S/T	( )		
MS-V-22C	1	F5	X				26	GB	AO	0	ALL	S/T	( )		
MS-V-22D	1	E5	X				26	GB	AO	0	ALL	S/T	( )		
MS-V-28A	1	F13	X				26	GB	AO	0	ALL	S/T	( )		
MS-V-28B	1	E13	X				26	GB	AO	0	ALL	S/T	( )		
MS-V-28C	1	F4	X				26	GB	AO	0	ALL	S/T	( )		
MS-V-28D	1	E4	X				26	GB	AO	0	ALL	S/T	( )		
MS-V-37 SERIES	2	C6-C11	X		X		10	CK	SA	C	CSD	S/E	N/A	TYPICAL OF 18	5
MS-V-38 SERIES	2	C6-C11	X		X		10	CK	SA	C	CSD	S/E	N/A	TYPICAL OF 18	5
MS-V-67A	1	F13	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MS-V-67B	1	F13	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MS-V-67C	1	F4	X				1-1/2	GT	MO	C	ALL	S/T	( )		

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
MS-V-67D	1	D4	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MS-RV-1A	1	F10			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-1B	1	E11			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-1C	1	F6			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-1D	1	E7			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-2A	1	F10			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-2B	1	E10			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-2C	1	F7			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-2D	1	E7			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-3A	1	F9			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-3B	1	E9			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-3C	1	F7			X		6 x 10	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-3D	1	E8			X		6 x 10	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A		
MS-RV-4A	1	F9			X		6 x 10	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-4B	1	E9			X		6 x 10	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-4C	1	F8			X		6 x 10	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	

* Tech Specs require stroking ADS Valves at least every 18 months with Reactor steam dome pressure greater than or equal to 100 psig.

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
MS-RV-4D	1	E8			X		6 x 10	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-5B	1	E9			X		6 x 10	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-5C	1	F8			X		6 x 10	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	

* See note on previous page.

System Name REACTOR FEEDWATER SYSTEM (RFW) Dwg. No. M529 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category				Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
			A	B	C	D									
RFW-V-10A	1	G12	X		X		24	CK	SA	0	CSD	S/E	N/A		6
RFW-V-10B	1	G5	X		X		24	CK	SA	0	CSD	S/E	N/A		6
RFW-V-32A	1	G13	X		X		24	CK	AO	0	CSD	S/E	N/A		6
RFW-V-32B	1	G5	X		X		24	CK	AO	0	CSD	S/E	N/A		6
RFW-V-65A	1	G13		X			24	GT	MO	0	CSD	S/T	( )		6
RFW-V-65B	1	G4		X			24	GT	MO	0	CSD	S/T	( )		6

System Name REACTOR RECIRCULATION COOLING (RRC, HY) Dwg. No. M530 Page 1 of 2

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RRC-V-13A	2	C12	X		X		3/4	CK	SA	0	REFUEL	S/E	N/A		7
RRC-V-13B	2	B12	X		X		3/4	CK	SA	0	REFUEL	S/E	N/A		7
RRC-V-16A	2	C14	X				3/4	GT	MO	0	REFUEL	S/T	( )		7
RRC-V-16B	2	B14	X				3/4	GT	MO	0	REFUEL	S/T	( )		7
RRC-V-19	1	F11	X				3/4	SV	SOL	0	ALL	S/E	N/A		1
RRC-V-20	1	F12	X				3/4	SV	SOL	0	ALL	S/E	N/A		1

System Name REACTOR RECIRCULATION COOLING (RRC, HY) Dwg. No. M 530 Page 2 of 2

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
HY-V-17A, B	2	E4		X			3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-18A, B	2	E4		X			3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-19A, B	2	E4		X			3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-20A, B	2	E4		X			3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-33A, B	2	E13		X			3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-34A, B	2	E13		X			3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-35A, B	2	E13		X			3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-36A, B	2	E13		X			3/4	SV	SOL	O	CSD	S/E	N/A		1, 10

System Name FLOOR DRAIN RADIOACTIVE (FDR) Dwg. No. M539

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
FDR-V-3	2	D6	X				3	GT	AO	O	ALL	S/T	( )		
FDR-V-4	2	D6	X				3	GT	AO	O	ALL	S/T	( )		

System Name EQUIPMENT DRAIN RADIOACTIVE (EDR) Dwg. No. M537

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
EDR-V-19	2	D9	X				3	GT	AO	O	ALL	S/T	( )		
EDR-V-20	2	D9	X				3	GT	AO	O	ALL	S/T	( )		

System Name PRIMARY CONTAINMENT COOLING & PURGE (CSP, CEP) Dwg. No. M543

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
CSP-V-5	2	C5		X			24	BF	AO	C	ALL	S/T	( )	NC/FO	
CSP-V-6	2	B14		X			24	BF	AO	C	ALL	S/T	( )	NC/FO	
CSP-V-7	2	B6	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CSP-V-8	2	B15	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CSP-V-9	2	B6		X			24	BF	AO	C	ALL	S/T	( )	NC/FO	
CSP-V-10	2	B6	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CEP-V-1B	2	J13	X				2	GT	AO	O	ALL	S/T	( )	NO/FC	
CEP-V-2B	2	J13	X				2	GT	AO	O	ALL	S/T	( )	NO/FC	
CEP-V-3B	2	C14	X				2	GT	AO	O	ALL	S/T	( )	NO/FC	
CEP-V-4B	2	C14	X				2	GT	AO	O	ALL	S/T	( )	NO/FC	
CVB-V-1A	2	B12	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1B	2	B12	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1C	2	B12	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1D	2	B12	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1E	2	B11	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1F	2	B11	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		

System Name PRIMARY CONTAINMENT COOLING & PURGE (CVB) Dwg. No. M543 Page 2 of 3

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
CVB-V-1G	2	B11	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1H	2	B11	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1J	2	B9	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1K	2	B9	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1L	2	B8	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1M	2	B8	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1N	2	B8	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1P	2	B8	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1Q	2	B7	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1R	2	B7	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1S	2	B7	X		X		24	CK	AO/SA	C	ALL	S/E	N/A		
CVB-V-1T	2	B7	X		X		24	CK	AO	C	ALL	S/E	N/A		
PI-VX-250	2	F13		X			1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-251	2	F13		X			1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-253	2	F13		X			1	SV	SOL	O	ALL	S/E	N/A		1

System Name PRIMARY CONTAINMENT COOLING & PURGE (CVB, PI) Dwg. No. M543

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
PI-VX-256	2	F7		X			1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-257	2	F7		X			1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-259	2	F7		X			1	SV	SOL	O	ALL	S/E	N/A		1
UN-NUMBERED	2	F12		X	X		1	CK	SA	C	ALL	S/E	N/A	HAVE POSITION INDICATION	
UN-NUMBERED	2	F7		X	X		1	CK	SA	C	ALL	S/E	N/A		
PI-VX-262	2	E13	X				1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-263	2	E13	X				1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-264	2	E13	X				1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-265	2	E14	X				1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-266	2	E7	X				1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-267	2	E7	X				1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-268	2	E7	X				1	SV	SOL	O	ALL	S/E	N/A		1
PI-VX-269	2	E6	X				1	SV	SOL	O	ALL	S/E	N/A		1

System Name CONTAINMENT ATMOSPHERE CONTROL (CAC) Dwg. No. M554

ACCIDENT MITIGATION

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
CAC-V-1A	2	F15		X			2	DIA	HO	C	ALL	S/T	( )		
CAC-V-1B	2	F1		X			2	DIA	HO	C	ALL	S/T	( )		
CAC-V-2	2	G10	X				4	GT	MO	C	ALL	S/T	( )		
CAC-V-2A	2	F12		X			4	DIA	HO	C	ALL	S/T	( )		
CAC-V-2B	2	F5		X			4	DIA	HO	C	ALL	S/T	( )		
CAC-V-4	2	E10	X				4	GT	MO	C	ALL	S/T	( )		
CAC-V-6	2	H10	X				4	GT	MO	C	ALL	S/T	( )		
CAC-V-8	2	D10	X				4	GT	MO	C	ALL	S/T	( )		
CAC-V-11	2	G6	X				4	GT	MO	C	ALL	S/T	( )		
CAC-V-13	2	E6	X				4	GT	MO	C	ALL	S/T	( )		
CAC-V-15	2	H6	X				4	GT	MO	C	ALL	S/T	( )		
CAC-V-17	2	D6	X				4	GT	MO	C	ALL	S/T	( )		
CAC-V-318A	2	D12		X			1	GT	MAN	C	REFUEL	POS IND	N/A		
CAC-V-318B	2	D12		X			1	GT	MAN	C	REFUEL	POS IND	N/A		
CAC-FCV-1A	2	H10	X				2-1/2	GB	HO	C	ALL	S/T	( )		

System Name CONTAINMENT ATMOSPHERE CONTROL (CAC) Dwg. No. M554

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
CAC-FCV-1B	2	H6	X				2-1/2	GB	HO	C	ALL	S/T	( )		
CAC-FCV-2A	2	G10	X				2-1/2	GB	HO	C	ALL	S/T	( )		
CAC-FCV-2B	2	G6	X				2-1/2	GB	HO	C	ALL	S/T	( )		
CAC-FCV-3A	2	D10	X				2-1/2	GB	HO	C	ALL	S/T	( )		
CAC-FCV-3B	2	D6	X				2-1/2	GB	HO	C	ALL	S/T	( )		
CAC-FCV-4A	2	F10	X				2-1/2	GB	HO	C	ALL	S/T	( )		
CAC-FCV-4B	2	E6	X				2-1/2	GB	HO	C	ALL	S/T	( )		
CAC-FCV-5A	3	F14		X			1	GB	HO	C	ALL	S/T	( )		
CAC-FCV-5B	3	F2		X			1	GB	HO	C	ALL	S/T	( )		
CAC-FCV-6A	2	G12		X			2	GB	HO	C	ALL	S/T	( )		
CAC-FCV-6B	2	G4		X			2	GB	HO	C	ALL	S/T	( )		
CAC-RV-63A	3	E12			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
CAC-RV-63B	3	E4			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
CAC-RV-65A	3	D13			X		1 1/2 x 3	RV	SA	C	REFUEL	BENCH TEST	N/A		
CAC-RV-65B	3	D4			X		1 1/2 x 3	RV	SA	C	REFUEL	BENCH TEST	N/A		

System Name CONTAINMENT INSTRUMENT AIR (CIA) Dwg. No. M556

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
CIA-V-20	2	J6	X				3/4	GB	MO	O	ALL	S/T	( )		
CIA-V-21	2	J6	X		X		3/4	CK	SA	O	REFUEL	S/E	N/A		3
CIA-V-24 SERIES	2	H4-K4	X		X		1/2	CK	SA	C	REFUEL	S/E	N/A	TYP. OF 4	3
CIA-V-30A	2	H6	X				1/2	GB	MO	O	ALL	S/T	( )		
CIA-V-30B	2	F6	X				1/2	GB	MO	O	ALL	S/T	( )		
CIA-V-31A	2	H6	X		X		1/2	CK	SA	O	REFUEL	S/E	N/A		3
CIA-V-31B	2	F6	X		X		1/2	CK	SA	O	REFUEL	S/E	N/A		3
CIA-V-36 SERIES	2	B4-H4	X		X		1/2	CK	SA	C	REFUEL	S/E	N/A	TYP. OF 18	3
CIA-V-39A	3	H7		X			1/2	SV	SOL	O	ALL	S/E	N/A		1
CIA-V-39B	3	H7		X			1/2	SV	SOL	O	ALL	S/E	N/A		1
CIA-V-40 SERIES	2	H5-B5	X		X		1/2	CK	SA	O	REFUEL	S/E	N/A	TYP. OF 7	3
CIA-V-41A	3	H7		X	X		1/2	CK	SA	O	REFUEL	S/E	N/A		3
CIA-V-41B	3	F7		X	X		1/2	CK	SA	O	REFUEL	S/E	N/A		3

System Name MAIN STEAM LEAKAGE CONTROL (MSLC) Dwg. No. M557 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	Valve Category B	Valve Category C	Valve Category D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
MSLC-V-1A	2	B7		X			1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-1B	2	B5		X			1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-1C	2	D7		X			1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-1D	2	D5		X			1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-2A	1	C8	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-2B	1	C8	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-2C	1	E8	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-2D	1	E8	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-3A	1	C9	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-3B	1	C8	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-3C	1	E8	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-3D	1	E8	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-4	2	J5		X			1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-5	2	J5		X			1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-9	2	H5		X			1-1/2	GT	MO	C	ALL	S/T	( )		
MSLC-V-10	2	H5		X			1-1/2	GT	MO	C	ALL	S/T	( )		

4.5 Requests for Relief from Certain Code Requirements

Relief Requests are presented to document differences between the Code and WNP-2's Valve Test Program. The requests include technical justification for the differences and, where appropriate, propose alternate testing.

GENERAL RELIEF REQUEST
(DELETED)

REQUEST FOR RELIEF NO. RV-1

System	Various
Valves(s)	
ASME Classification Function	Solenoid valves affected by this relief request are identified in TABLE A.
Code Testing Requirement	1. Timing of valve stroke (IWV-3413)
Bases for Relief	1. Solenoid valves are very rapid acting, with stroke times much less than one second. It is meaningless to measure their stroke times "to the nearest second".
Alternate Testing to be Performed	1. Valves will be full stroke tested. Satisfactory operation of equipment downstream of the solenoid valve will constitute satisfactory valve operation.

Quality/Safety Impact

The only valves in Table A for which timing might be an important parameter are the Category A valves which are containment isolation valves. However, these valves have position indication displayed in the Control Room and on the Transient Data Acquisition System. Furthermore, each of the Category A valves have backup valves which can be used to isolate the line should it be required.

The proposed exercise testing and regular position indication verification will provide adequate assurance of quality and public safety.

RV-1

TABLE A

Valve	Code Class	Category	Function
HY-V-17A, B	2	B	Hydraulic supply for Reactor Recirculation Flow Control Valves
HY-V-18A, B	2	B	
HY-V-19A, B	2	B	
HY-V-20A, B	2	B	
HY-V-33A, B	2	B	
HY-V-34A, B	2	B	
HY-V-35A, B	2	B	
HY-V-36A, B	2	B	
RRC-V-19	1	A	Reactor recirculation sampling Iso valve.
RRC-V-20	1	A	Reactor recirculation sampling Iso valve.
CIA-V-39A	2	B	Cross ties between air and nitrogen
CIA-V-39B	2	B	headers.
DO-V-40A	3	B	Diesel fuel oil day tank 3A inlet valve
DO-V-40B	3	B	Diesel fuel oil day tank 3B inlet valve
DO-V-43	3	B	Diesel fuel oil day tank 3C inlet valve
CRD-V-110A	2	B	Back-up Scram Valve (Air Supply)
CRD-V-110B	2	B	Back-up Scram Valve (Air Supply)

RV-1

TABLE A (Cont'd)

Valve	Code Class	Category	Function
PI-VX-251	2	B	Radiation monitor RAD-RE-12B inlet valve
PI-VX-250	2	B	Radiation monitor RAD-RE-12B outlet valve
PI-VX-253	2	B	Radiation monitor RAD-RE-12B outlet valve
PI-VX-256	2	B	Radiation monitor RAD-RE-12A inlet valve
PI-VX-257	2	B	Radiation monitor RAD-RE-12A inlet valve
PI-VX-259	2	B	Radiation monitor RAD-RE-12A outlet valve
PI-VX-262	2	A	H_2, O_2 monitor inlet and outlet valves (S-SR-13)
PI-VX-263	2	A	
PI-VX-264	2	A	
PI-VX-265	2	A	
PI-VX-266	2	A	H_2, O_2 monitor inlet and outlet valves (S-SR-14)
PI-VX-267	2	A	
PI-VX-268	2	A	
PI-VX-269	2	A	
CAS-V-453	2	A	Air supply to drywell - wetwell down-comer vacuum breakers.
RHR-V-60A	2	B	Loop A sample (inboard)
RHR-V-60B	2	B	Loop B sample (inboard)
RHR-V-75A	2	B	Loop A sample (outboard)
RHR-V-75B	2	B	Loop B sample (outboard)
RHR-V-182	2	B	Drain Vv between Valves isolating Service Water from RHR

RV-1

TABLE A (Cont'd)

Valve	Code Class	Category	Function
SW-V-201	3	B	Cooling Water to H_2, O_2 analyzers
SW-V-204	3	B	S-SR-13, 14.
SW-V-206	3	B	
SW-V-209	3	B	
SW-V-210	3	B	
SW-V-211	3	B	
SW-V-212	3	B	
SW-V-213	3	B	

REQUEST FOR RELIEF NO. RV-2

System	Various Emergency Core Cooling Systems
Valve(s) ASME Classification Function	Valves affected by this relief request are identified in TABLE B.
Code Testing Requirement	Quarterly valve exercising (IWV-3411)
Bases for Relief	1. Valves cannot be opened against the differential pressure which exists across them during power operations. Reactor coolant system pressure holds the valves closed. 2. Valves are located inside containment and cannot be temporarily isolated to allow testing.
Alternate Testing to be Performed	1. Valve exercising will be performed during cold shutdown.

Quality/Safety Impact

More frequent testing of the valves in Table B would require plant shutdowns solely to accommodate testing. Such requirements violate the intent of the Code (IWV-3412(a)), which recognizes that certain valve tests are not practical during plant operation. Furthermore, the redundancy of the emergency core cooling system ensures that no single failure of the valves in Table B will compromise the plant. The proposed testing and plant design, provide an acceptable level of quality and safety.

RV-2

TABLE B

Valve	Code Class	Category	Function
HPCS-V-5	1	A-C	HPCS discharge to reactor vessel.
LPCS-V-6	1	A-C	LDCS discharge to reactor vessel.
RHR-V-41A	1	A-C	RHR loop A discharge to reactor
RHR-V-41B	1	A-C	RHR loop B discharge to reactor
RHR-V-41C	1	A-C	RHR loop C discharge to reactor
RHR-V-50A	1	A-C	RHR loop A discharge to recirculation pump discharge.
RHR-V-50B	1	A-C	RHR loop B discharge to recirculation pump discharge.
RHR-V-209	1	A-C	Pressure relief bypass around RHR-V-9.
RCIC-V-66	1	A-C	RCIC discharge to reactor vessel head.

REQUEST FOR RELIEF NO. RV-3

System	Containment Instrument Air
Valve(s) ASME Classification Function	Valves affected by this relief request are identified in TABLE C.
Code Testing Requirement	Quarterly testing (IWV-3412) Position indication verification (IWV-3522)
Bases for Relief	1. The 40 series, 36 series and 24 series valves are located inside containment and cannot be accessed during power operations. There is no way to remotely isolate the valves and observe the pressure decay of the accumulators. 2. There is no local or remote position indication for these check valves.
Alternate Testing to be Performed	1. During refueling outages, pressure decay tests will be performed for the accumulators associated with the Main Steam Isolation Valves and with the Main Steam Safety/Relief Valves in order to verify closure ability of 40 series, 36 series, and 24 series valves. Each accumulator will be tested at least every two years. 2. Closure ability of CIA-V-21, 31A and B, and 41A and B will be verified by normal 10CFR50, Appendix J (Type C) testing.

Quality/Safety Impact

The proposed testing qualitatively verifies valve closure on the most practical regular basis. This satisfies the intent of the Code (IWV-3412). Valve opening is verified when the accumulators are pressurized in preparation for the pressure decay test.

The valves in Table C are in the pneumatic supply to the auto-depressurization System valves, a safety related system. However, the proposed alternate testing together with the redundancy of the pneumatic supplies and individual accumulators, of the ADS valves themselves and of the high pressure injections systems assures an acceptable level of quality and public safety.

RV-3

TABLE C

Valve	Code Class	Category	Function
CIA-V-31A	2	B-C	N_2 supply to ADS valves (O/C)
CIA-V-31B	2	B-C	
CIA-V-41A	2	B-C	Cross tie between air and N_2 line
CIA-V-41B	2	B-C	
CIA-V-40 series (7 valves)	2	A-C	N_2 to ADS Accumulators (inside containment
CIA-V-36 series (18 valves)	2	A-C	Air supply to Main Steam Relief Valves' Accumulators (inboard check valve)
CIA-V-24 series (4 valves)	2	A-C	Air supply to Main Steam Isolation Valves (Inboard)
CIA-V-21-	2	B-C	Instrument air supply to containment (outboard check valve).

REQUEST FOR RELIEF NO. RV-4

System	Standby Liquid Control (SLC)
Valve(s)	SLC-V-6, SLC-V-7
ASME Classification	Code Class: 1 Category: A-C
Function	Standby Liquid Control discharge to reactor vessel.
Code Testing Requirement	1) Quarterly exercising (IWV-3521) 2) Cold shutdown exercising (IWV-3522)
Basis for Relief	1. Valves have no operator with which they may be stroked. 2. Exercising the valves require the initiation of the SLC system and full flow injection into the reactor vessel. Initiation of SLC flow involves the discharge of Class D explosive activated valves.
Alternate Testing to be Performed	At least once per 18 months, one of the Standby Liquid Control System loops, including the associated explosive valve, will be initiated. A flow path to the Reactor Vessel will be verified by pumping demineralized water to the vessel. Valve closure capability will be verified in conjunction with 10CFR50 Appendix J (Type C) testing.

Quality/Safety Impact

The purposed testing complies fully with the intent of the Code (IWV-3522). Additionally it is noted that the SLC system will be required to perform its safety function only under very infrequent circumstances (ATWS). The proposed testing provides adequate assurances of quality and public safety.

REQUEST FOR RELIEF NO. RV-5

System	Main Steam
Valve(s)	MS-V-37 series (18 total), MS-V-38 series (18 total)
ASME Classification	Code Class: 3 Category: A-C
Function	Vacuum Breakers for main steam relief line downcomers.
Code Testing Requirement	Quarterly exercising (IWV-3521)
Bases for Relief	1. Valves have no power operator by which they may be stroked remotely. 2. Valves are located inside primary containment and, consequently, are inaccessible during power operations.
Alternate Testing to be Performed	Valves are accessible during cold shutdown and will be exercised at that time in accordance with the requirements of paragraph IWV-3522. Valves will be verified to be closed at the completion of exercise testing.

Quality/Safety Impact

The proposed testing complies fully with the intent of the Code (IWV-3522) which allows less frequent testing if "such operation is not practical during plant operation". Further, each downcomer has redundant vacuum breakers for additional reliability. The alternate testing and valve redundancy assure acceptable levels of quality and safety.

REQUEST FOR RELIEF NO. RV-6

System	Reactor Feedwater (RFW)
Valve(s) ASME Classification Function	Valves affected by this relief request are identified in TABLE D.
Code Testing Requirement	Quarterly exercising (IWV-3411, IWV-3521)
Bases for Relief	1. Closure of either Category A valve (RFW-V-65A, 65B) would result in a loss of flow to the reactor vessel and cause a significant reduction of reactor coolant inventory. 2. Category A-C valves are held open by feedwater flow and cannot be closed during power operations.
Alternate Testing to be Performed	Valves will be exercised during cold shutdown.

Quality/Safety Impact

The Code does not require disruption of plant operation to support valve testing (IWV-3412, IWV-3522). The proposed testing is the maximum practical during normal power operations and, together with a system design featuring three valve in series, assures acceptable levels of quality and safety.

RV-6

TABLE D

Valve	Code Class	Category	Function
RFW-V-10A	1	A-C	Reactor Feedwater inboard check
RFW-V-10B	1	A-C	valves.
RFW-V-32A	1	A-C	Reactor Feedwater outboard check
RFW-V-32B	1	A-C	valves.
RFW-V-65A	1	A	Reactor Feedwater stop valves.
RFW-V-65B	1	A	

REQUEST FOR RELIEF NO. RV-7

System	Reactor Recirculation Coolant (RRC)
Valve(s) ASME Classification Function	Valves affected by this relief request are identified in TABLE E.
Code Testing Requirement	Quarterly exercising (IWV-3411 and IWV-3521)
Bases for Relief	1. Closure of Category A valves (RCC-V-16A, -16B) would terminate seal purge water flow to recirculation Pump 1A or 1B, respectively. Loss of purge flow may result in excessive seal wear and possibly failure of the seal. The risk associated with seal failure are greater than the benefits gained by quarterly valve testing. 2. Category A-C valves are held open by purge water flow and cannot be closed during power operations.
Alternate Testing to be Performed	Valves will be exercised during cold shutdown.

Quality/Safety Impact

NRC Guidance (i.e., Draft Reg. Guide MS901-4) states that "valves which when exercised (cycled) could put the plant in an unsafe condition" should be excluded from testing. The valves in Table E, if cycled, would endanger the reliability of the Reactor Recirculation pumps and, consequently, cause unsafe conditions. Postponing, therefore, contributes to assuring acceptable levels of quality and safety.

RV-7

TABLE E

Valve	Code Class	Category	Function
RRC-V-13A	2	A-C	Recirculation pumps' seal purge
RRC-V-13B	2	A-C	line inboard isolation valve.
RRC-V-16A	2	A	Recirculation pumps' seal purge
RRC-V-16B	2	A	water supply line outboard isolation valve.

REQUEST FOR RELIEF NO. RV-8

System	Reactor Closed Coolant (RCC)
Valve(s) ASME Classification Function	Valves affected by this relief request are identified in TABLE F.
Code Testing Requirement	Quarterly exercising (IWV-3411 and IWV-3421).
Basis for Relief	Closure of any isolation valve will interrupt cooling water flow to the Reactor Recirculation (RRC) Pump seals, to the RRC pump motor coolers and to the Drywell Air Coolers possibly causing equipment failure or disruption of reactor operation. The risks associated with these consequences outweigh any potential benefits derived from quarterly testing of these valves.
Alternate Testing to be Performed	Valves will be exercised during cold shutdown.

Quality/Safety Impact

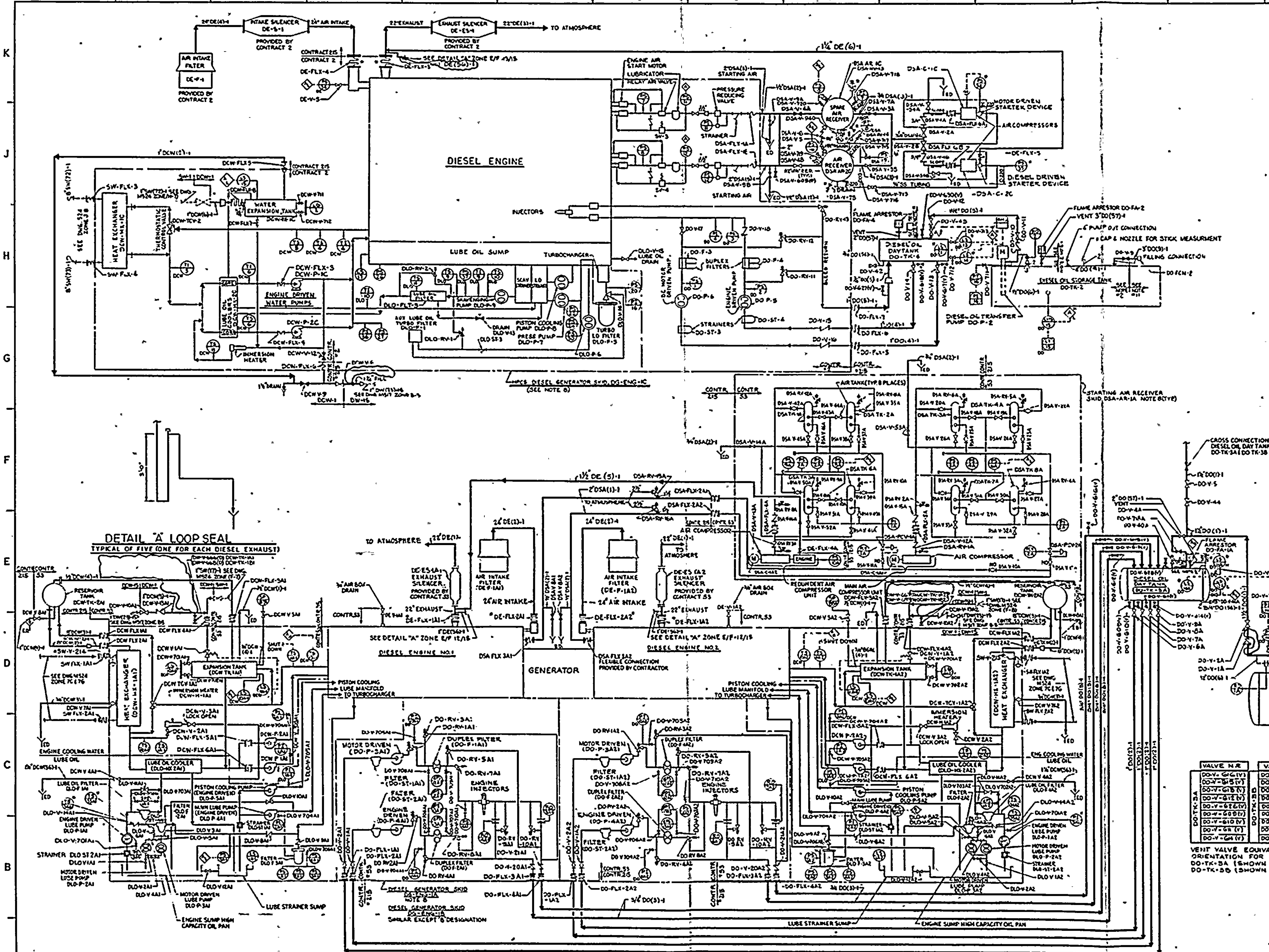
Failure of any one of the valves in Table F would terminate cooling water flow to equipment inside containment. NRC guidance suggests that such valves are not required to be tested to normal IWV schedules. Therefore, granting of this relief request will contribute to acceptable levels of quality and safety by increasing the reliability of plant equipment.

5.0 Quality Assurance Program

The WNP-2 Pump and Valve Inservice Test Program activities will be conducted in accordance with Topical Report WPPSS-QA-004, the Supply System's Operational Quality Assurance Program description.

6.0 Flow Diagrams

The Flow Diagrams used to generate this Program are included for user reference. Due to the time required for Program publication, an administrative cut-off date of June,1982 was chosen to "freeze" drawing revisions used for Revision 1 of the Program. However, system design is not expected to change radically, and, in any case, more current diagrams will be provided as the Program is updated.



NOTES

1. ALL DSA, DCW & DE PIPING AND ASSOCIATED COMPONENTS ON THIS DWG INCLUDED IN CONTRACT 215 ARE CLASSIFIED

   QUALITY CLASS I
   CODE GROUP D
   SEISMIC CATEGORY I

2. ALL DIESEL OIL (DO) PIPING AND ASSOCIATED COMPONENTS ON THIS DWG INCLUDED IN CONTRACT 215 EXCEPT AS NOTED IN NOTES 10 & 11 ARE CLASSIFIED:

   QUALITY CLASS I
   CODE GROUP C
   SEISMIC CATEGORY I

3. ALL PIPING VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING INCLUDED IN CONTRACT 215 EXCEPT WHERE CONTRACT INTERFACES ARE DENOTED BY:

   CONTRACT #215
   CONTRACT #2 OR #53

4. ALL PIPING AND FITTINGS FOR DE(1)-1 AND DE(2)-1 ARE SUPPLIED BY CONTRACT #53 AND SUPPORTED AND ERECTED BY CONTRACT #215

5. PIPING AND EQUIPMENT FOR DIESEL GENERATOR, DG ENG-1B IS IDENTICAL TO THAT SHOWN FOR DIESEL GENERATOR, DG ENG-1A

6. EQUIPMENT TAG NUMBER WITH SUFFIX A1 REFERS TO NO.1 ENGINE OF DIESEL GENERATOR DG ENG-1A SUFFIX A2 REFERS TO NO 2 ENGINE OF DIESEL GENERATOR DG-ENG-1A. SUFFIX B1 REFERS TO NO.1 ENGINE OF DIESEL GENERATOR DG ENG 1B AND SUFFIX B2 REFERS TO NO.2 ENGINE OF DIESEL GENERATOR DG ENG-1B

7. ALL ITEMS MARKED # ARE FURNISHED WITH ASSOCIATED EQUIPMENT.

8. ALL PIPING, COMPONENTS, AND INSTRUMENTATION SHOWN WITHIN THE CONFINES OF THE SKID PACKAGE ARE SUPPLIED WITH THE ASSOCIATED EQUIPMENT.

9. DIESEL OIL STORAGE AND DAY TANK VENTS TO BE PIPED OUTSIDE OF BUILDING.

10. ALL DIESEL OIL (DO) PIPING, DOWNSTREAM OF THE LAST ISOLATION VALVE OPEN TO THE ATMOSPHERE, INCLUDED IN CONTRACT 215 IS CLASSIFIED:

    QUALITY CLASS II
    CODE GROUP D
    SEISMIC CLASS II

11. ALL DIESEL OIL (DO) PIPING AND ASSOCIATED COMPONENTS ON THIS DRAWING, INCLUDED IN CONTRACT 215 AND REFERRED TO BY THIS NOTE ARE CLASSIFIED:

    QUALITY CLASS II
    CODE GROUP D
    SEISMIC CLASS II

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE

FSAR FIG. NO. 9.5-4

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

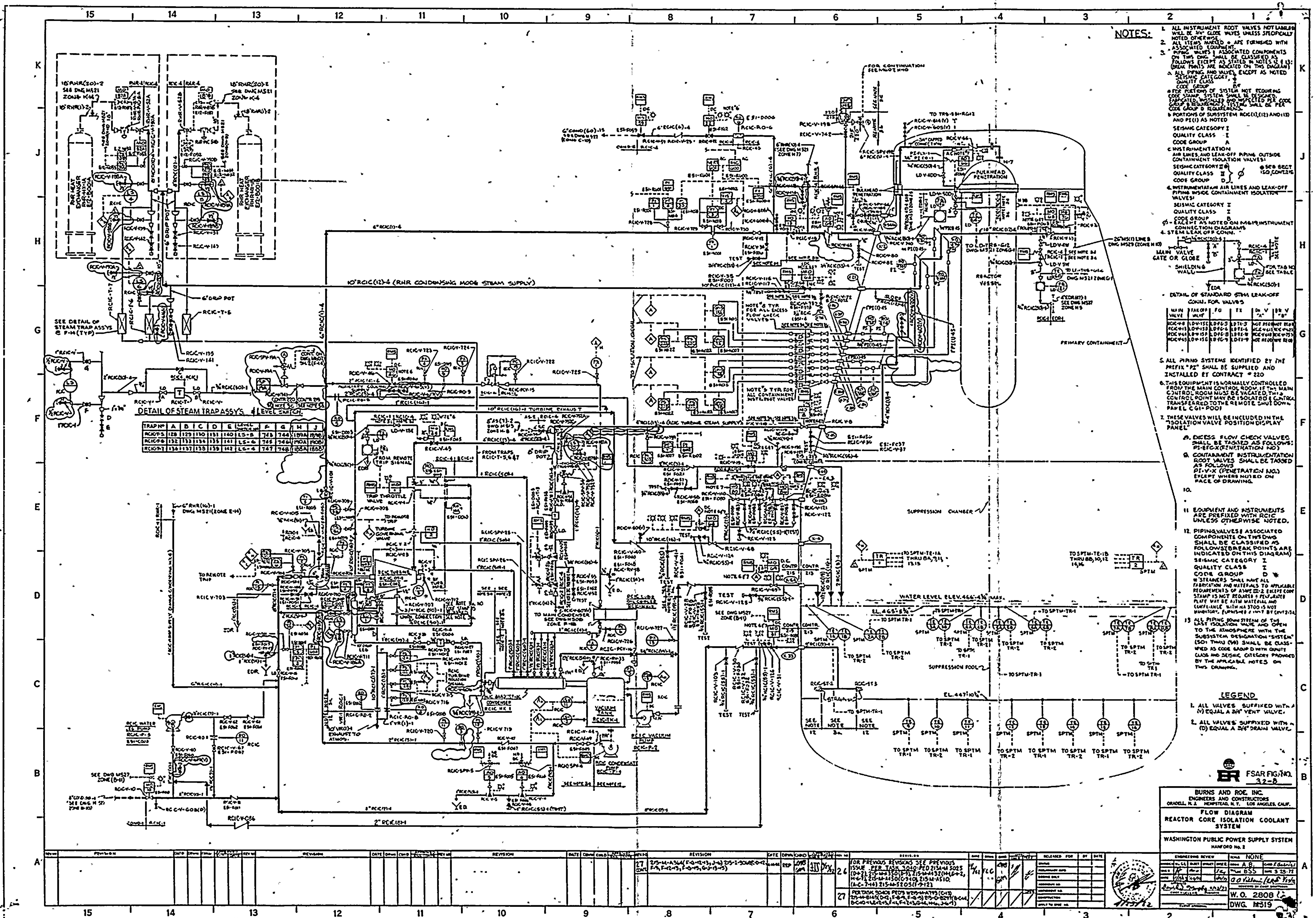
FLOW DIAGRAM
DIESEL OIL & MISC SYSTEM
DIESEL GENERATOR BUILDING

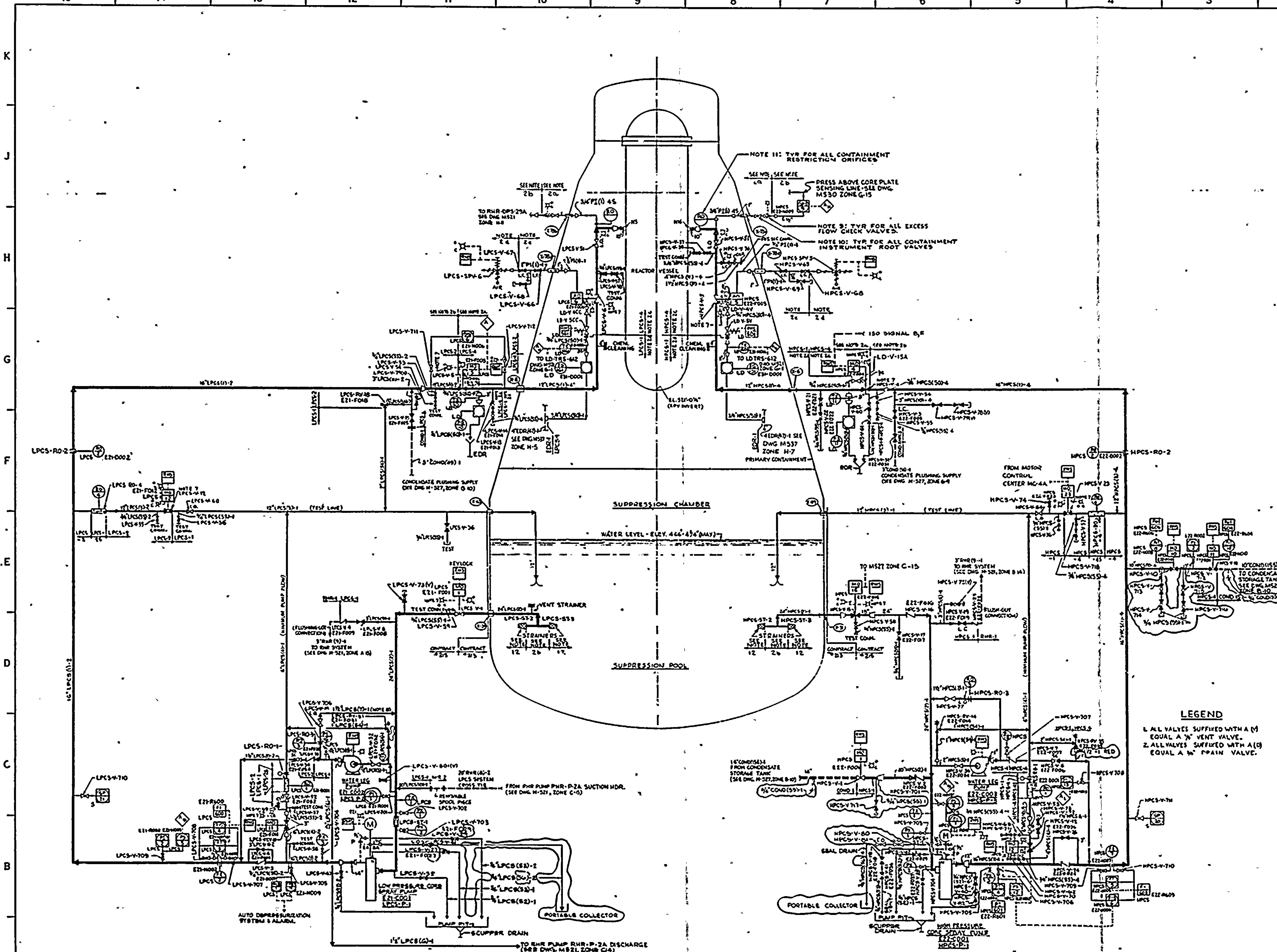
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE

W.O. 2808
DWG. M512

[illegible]


NOTES:
LEGEND
1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.
DETAIL OF STEAM TRAP ASSY'S & LEVEL SWITCH
10"RCIC(12)-4 (RHR CONDENSING MODE STEAM SUPPLY)
REACTOR VESSEL
PRIMARY CONTAINMENT
SUPPRESSION CHAMBER
SUPPRESSION POOL
WATER LEVEL ELEV. 466'-4¾" MAX.
VACUUM TANK RCIC-TK-1
FSAR FIG. NO. 32-8
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.
FLOW DIAGRAM
REACTOR CORE ISOLATION COOLANT SYSTEM
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2
SCALE NONE
W.O. 2808
DWG. M519



NOTES:

1. ALL INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
2. PIPING VALVES AND ASSOCIATED COMPONENTS ON THIS DWG SHALL BE CLASSIFIED AS FOLLOWS EXCEPT AS STATED IN NOTES 12 & 13: (BREAK POINTS ARE INDICATED ON FLOW DIAGRAM)
   a. PIPING AND VALVES OUT THROUGH OUTERMOST REACTOR ISOLATION VALVES
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP A
   b. PIPING AND VALES BEYOND OUTERMOST REACTOR ISOLATION VALVES PLUS ALL INSTRUMENT LINES EXCEPT THE PUMP SEAL DRAIN LINES DESIGNATED AS 3/4"LPCS(52)-2 AND 3/4 HPCS(52)-6
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP B
   c. INSTRUMENTATION AIR LINES AND LEAK-OFF PIPING INSIDE CONTAINMENT ISOLATION VALVE:
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP B
   d. INSTRUMENTATION AIR LINES AND LEAK-OFF PIPING OUTSIDE CONTAINMENT ISOLATION VALVE: AND THE PUMP SEAL DRAIN LINES DESIGNATED 3/4"LPCS(52)-2 AND 3/4 HPCS(52)-6
      SEISMIC CATEGORY I ● } Ø
      QUALITY CLASS I
      CODE GROUP D
      ● SEE SECTION 15Q CONTRACT 215
3. FOR DRAIN OR LEAK-OFF LINES, THE PIPING CLASSIFICATION IS AS SHOWN ON DETAIL BELOW

4.
5.
6. ALL PIPING SYSTEMS IDENTIFIED BY THE PREFIX "PI" SHALL BE SUPPLIED AND INSTALLED BY CONTRACT # 220
7. THESE VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL"
8. ALLOW ADEQUATE PIPING SURFACE AREA FOR COOLING OF PUMP LPCS-P-2.
9. EXCESS FLOW CHECK VALVES SHALL BE TAGGED AS FOLLOWS
   PI-EFC-X(PENETRATION NO)
10. CONTAINMENT INSTRUMENTATION ROOT VALVES SHALL BE TAGGED AS FOLLOWS:
   PI-V-X (PENETRATION NO) EXCEPT WHERE NOTED ON FACE OF DRAWING
11. CONTAINMENT RESTRICTION ORIFICES SHALL BE TAGGED AS FOLLOWS:
   PI-RO-X(PENETRATION NO)
12. PIPING VALVES & ASSOCIATED COMPONENTS ON THIS DWG SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON THIS DIAGRAM)
   SEISMIC CATEGORY I
   QUALITY CLASS I
   CODE GROUP D *
   * STRAINERS SHALL HAVE ALL FABRICATION & MATERIALS TO APPLICABLE REQUIREMENTS OF ASME III-2 EXCEPT CODE STAMP IS NOT REQUIRED & PERFORATED P MAY BE ASTM MATERIAL AND COMPLIANCE WITH NA-3700 IS NOT MANDATORY. FURNISHED AND INSTALLED BY CONTR. 213A
   Ø EXCEPT AS NOTED ON M619 INSTRUMENT CONNECTION DIAGRAMS.
13. ALL PIPING DOWNSTREAM OF THE LAST ISOLATION VALVE AND OPEN TO THE ATMOSPHERE WITH THE SUBSYSTEM DESIGNATION "SYSTEM" (50) THRU (59) SHALL BE CLASSIFIED AS CODE GROUP D WITH QUALITY CLASS AND SEISMIC CATEGORY PROVIDED BY THE APPLICABLE NOTES ON THIS DRAWING.

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.

REV	REVISION	DATE
19	FOR REVISION NE 18 SEE RECORD M.A.C. PER TASK 3040: PED'S 215-M-5211 (H8), 215-M-3263 (K-2, C/D-1,2), W215-M-604 (G-1,2)	
20	PER TASK 3040 PED'S 215-E-4409 (F-14), 215-M-4377 (C-6, C-12)	
21	PER TASK 3040: PED'S 213A-M-0432 (D-12), 213A-M-0433 (E-10)	
22	PER TASK 3040: PED'S 220-Z-556 (G-13) 215-M-4607 (G-9, G-H-8, G-H-6, G-7) 215-M-4291 (D-E-5-6)	
23	PER TASK 3040: PED'S 215-M-4356 (B-6) W215-M-4397 (D-7, D-11)	
24	PER TASK 3040 PED-215-M-A135 (J-7 E-11-12, C-11) W215-M-3202 215-M-A422 (C-12) D-5-A491 (C-4, F-G-6-7) 215-M-A583 (F-G-5-6, G-11-12) 213A-M-3025 (D-12) W215-M-A730 (C-4, C-6, C-12) W215-M-A340 (C-12)	
25	PER TASK 3040 PED'S 215-E-5334 (E-14), B-10 (B) 215-M-4445 (C-4) W215-M-4377 (C-6, C-12) E-11-12, 215-M-6585 (B-4) W215-M-4315 (B-4) W215-0-0591 (C-12, C-14)	

FSAR FIG. NO. 3.2-7

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

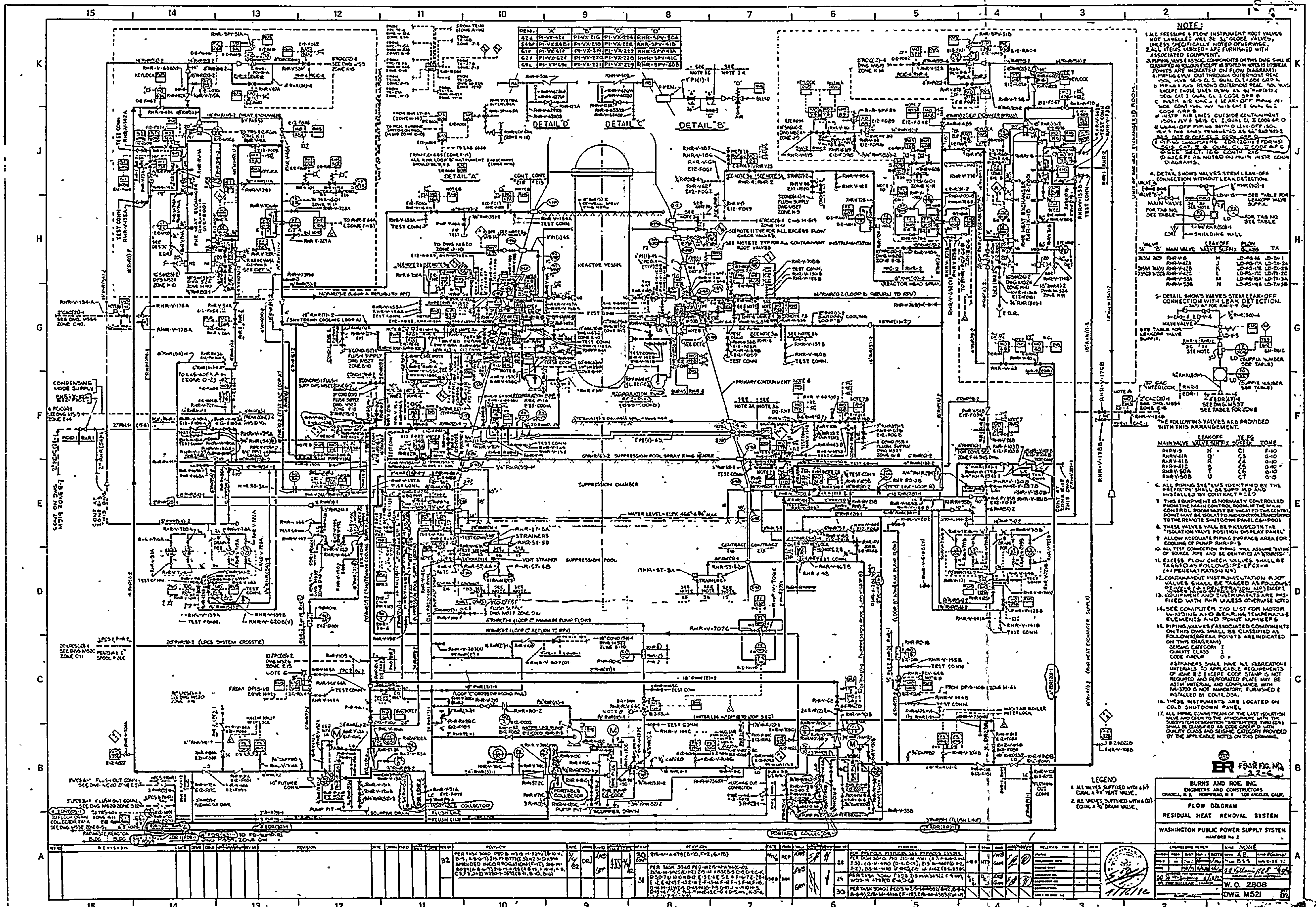
FLOW DIAGRAM
HPCS AND LPCS SYSTEMS
REACTOR BUILDING

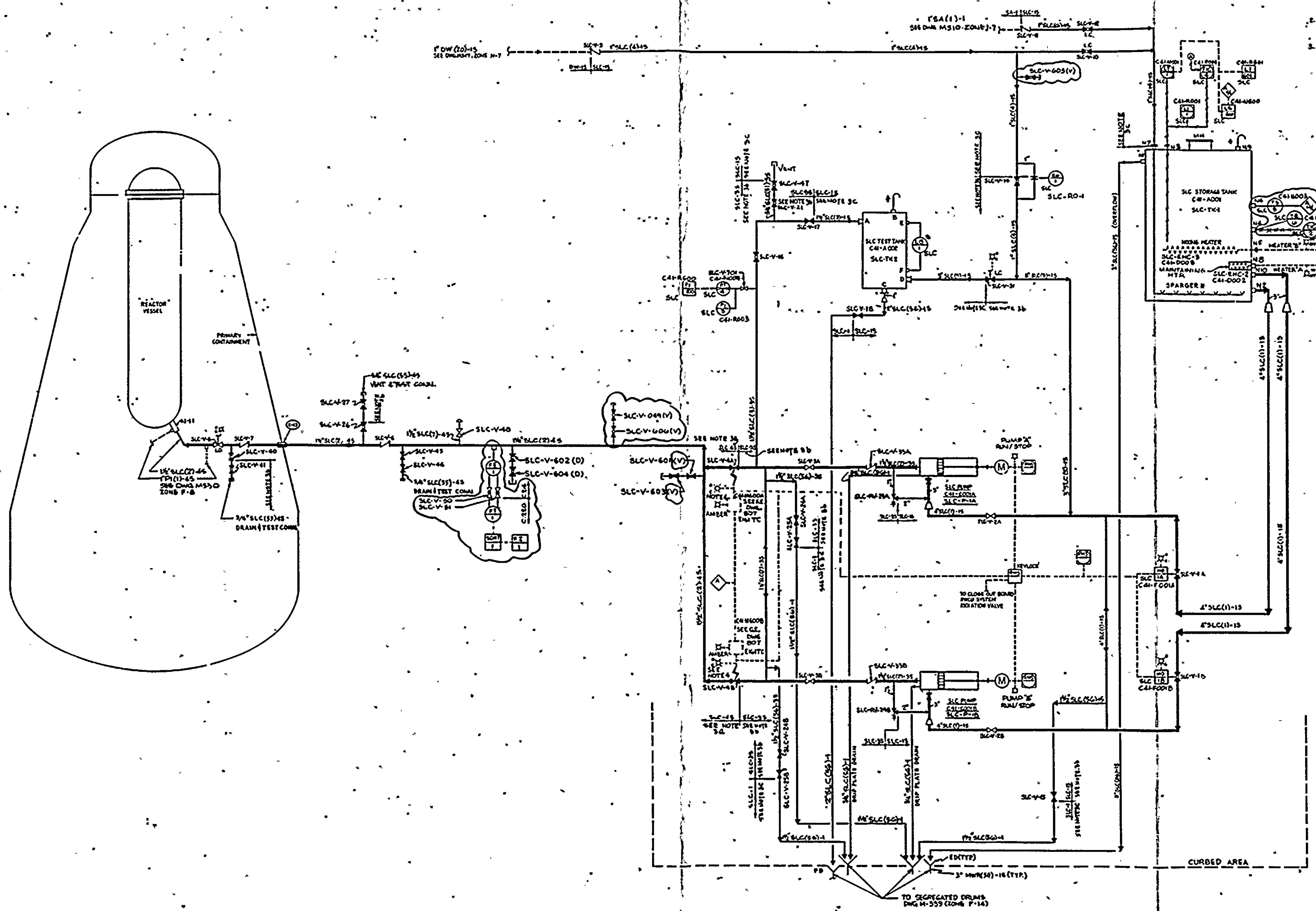
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No 2

ENGINEERING REVIEW

SCALE NONE
DRAWN PAI/AB
CHKD BSS
DATE 1-18-72

W.O. 2808
DWG. M520 . 25


NOTE:
DETAIL "A"
DETAIL "B"
DETAIL "C"
DETAIL "D"
REACTOR VESSEL
PRIMARY CONTAINMENT
SUPPRESSION CHAMBER
SUPPRESSION POOL
LEGEND
1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.
FSAR FIG. NO. 3.2-6
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.
FLOW DIAGRAM
RESIDUAL HEAT REMOVAL SYSTEM
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No 2
SCALE NONE
W.O. 2808
DWG. M521



NOTES:

1. ALL INSTRUMENT ROOT VALVES NOT LABELED SHALL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
2. ALL ITEMS MARKED ¢ ARE FURNISHED WITH ASSOCIATED EQUIPMENT.
3. PIPING, VALVES AND ASSOCIATED COMPONENTS ON THIS DWG. SHALL BE CLASSIFIED AS FOLLOWS:
   a. ALL PIPING, VALVES AND COMPONENTS DESIGNATED AS SLC-45 EXCEPT AS NOTED.
      SEISMIC CATEGORY – I
      QUALITY CLASS – I
      CODE GROUP – A
   b. ALL PIPING, VALVES AND COMPONENTS DESIGNATED BY THE NOTE "SEE NOTE 3b".
      SEISMIC CATEGORY – II
      QUALITY CLASS – II
      CODE GROUP – D
   c. ALL PIPING, VALVES AND COMPONENTS DESIGNATED BY THE NOTE "SEE NOTE 3c" OR THE SYSTEM DESIGNATION SLC (56) UNLESS NOTED.
      SEISMIC CATEGORY – II ●
      QUALITY CLASS – II
      CODE GROUP – D
      ● SEE SECTION 15Q, CONTRACT 215.
4. THESE VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL."

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE

FSAR FIG. NO. 3.2-6

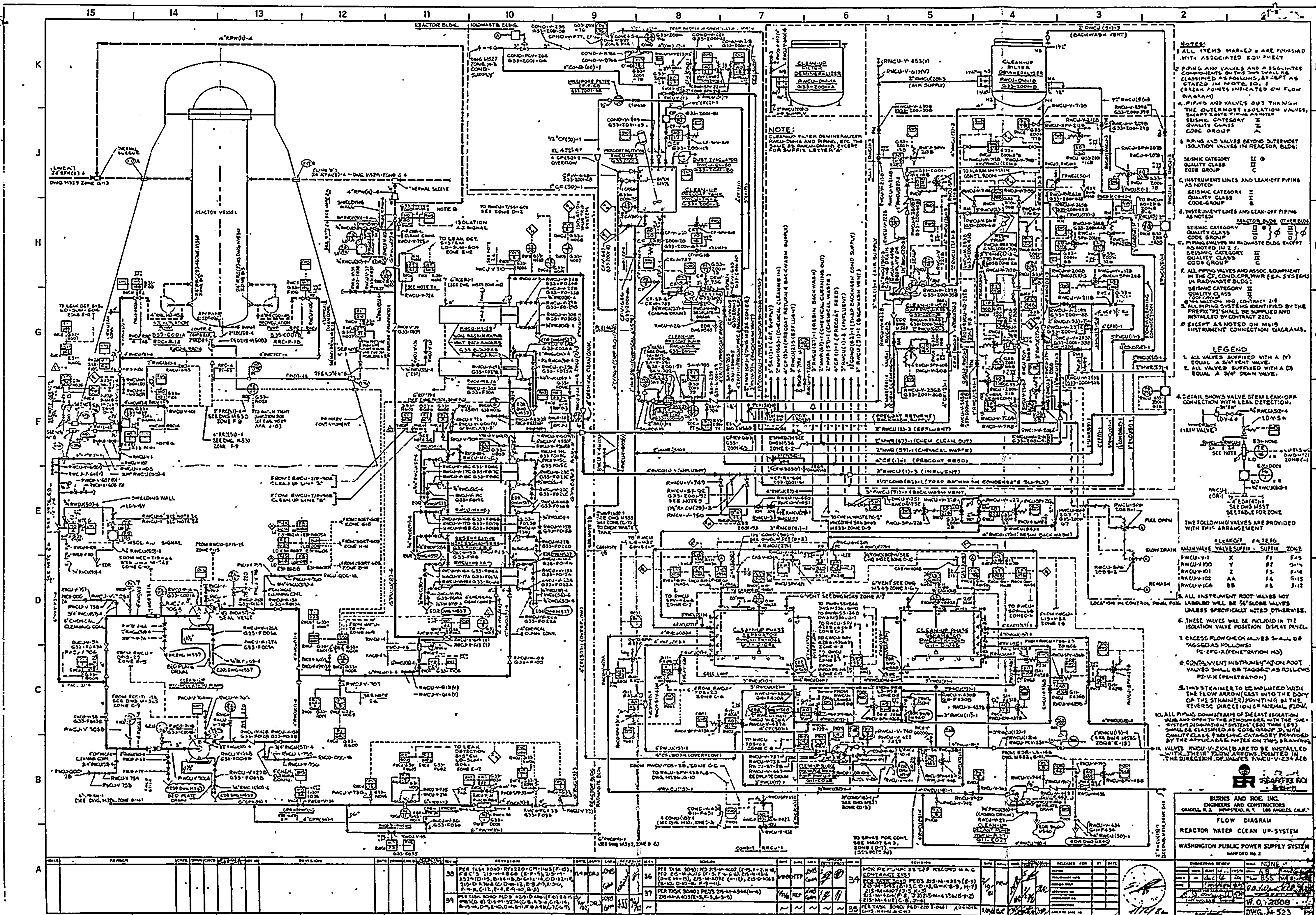
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N. J. HEMPSTEAD, N. Y. LOS ANGELES, CALIF.

FLOW DIAGRAM
STANDBY LIQUID CONTROL SYSTEM
REACTOR BUILDING

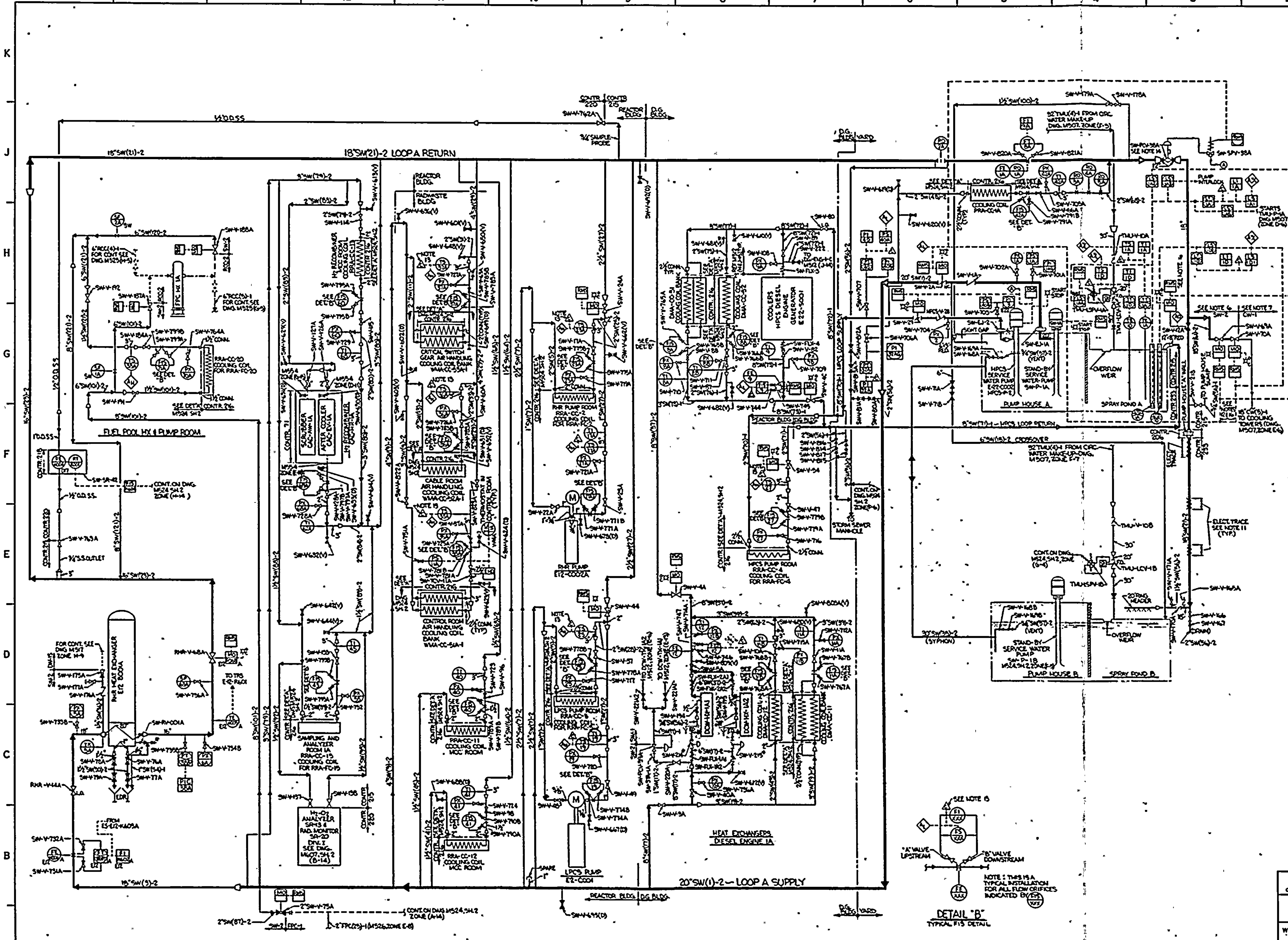
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

REV NO	REVISION	DATE
11	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE PER TASK 5040: RFI-215-1982 (6-7)	
12	PER TASK 8040 PEDS 215-0-A7US (US, F-9) W215-M-B445, 220-Z-0512 (6-F-10-11) 215-M-0171 (J-1) W220-Z-0665 (H-8)	3/15/82

SCALE NONE
DRN. TK/AB
CHKD. BSS DATE 9-24-72
W.O. 2808
DWG. M522 REV 12



REACTOR BLDG.
RADWASTE BLDG.
REACTOR VESSEL
PRIMARY CONTAINMENT
SHIELDING WALL
CLEAN-UP FILTER DEMINERALIZER
NOTES:
LEGEND
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.
FLOW DIAGRAM
REACTOR WATER CLEAN UP-SYSTEM
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2
SCALE NONE
W.O. 2808
DWG. M-523



NOTES:

1. ALL INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
2. VALVES SW-V-2A, B AND SW-V-29 MUST BE CLOSED PRIOR TO PUMP START. VALVES WILL BE INTERLOCKED WITH PUMPS TO PREVENT PUMP START UNLESS VALVE IS CLOSED. VALVES WILL RUN CLOSE ON PUMP STOP. VALVES ARE BUTTERFLY TYPE.
3. PVC-38A AND 38B ARE PROVIDED TO MAINTAIN SYSTEM PRESSURE ABOVE RHR SYSTEM PRESSURE DURING COOL DOWN CONDITIONS.
4. ALL ITEMS MARKED * ARE FURNISHED WITH ASSOCIATE EQUIPMENT.
5. ALL INSTRUMENTS ON THIS DWG. TO BE IDENTIFIED BY PREFIX "SW" UNLESS SPECIFICALLY NOTED (E.G.-SW-PS-40)
6. ALL PIPING AND VALVES AND ASSOCIATED COMPONETS IN THE SW SYSTEM ON THIS DWG. EXCEPT AS STATED IN NOTE 17 AND SW(56) AS INDICATED SHALL BE CLASSIFIED AS FOLLOWS—
   SEISMIC CATEGORY I
   QUALITY CLASS I } Ø
   CODE GROUP C
   Ø EXCEPT AS NOTED ON M619 INSTRUMENT CONNECTION DIAGRAMS
7. ALL PIPING AND VALVES AND ASSOCIATED COMPONENTS IN THE CW AND TMU SYSTEMS AS INDICATED SHOWN ON THIS DWG. SHALL BE CLASSIFIED AS FOLLOWS—
   SEISMIC CATEGORY II
   QUALITY CLASS II
   CODE GROUP D
8. ALL PIPING SHALL BE SUPPLIED AND ERECTED BY THE 215 CONTRACT EXCEPT AS NOTED OTHERWISE.
9. FOR ALL PIPING ARRANGEMENTS AT COOLING COILS SEE DETAIL A.
10. THIS EQUIPMENT IS NORMALLY CONTROLLED FROM THE MAIN CONTROL ROOM. IF THE MAIN CONTROL ROOM MUST BE VACATED THIS CONTROL POINT MAY BE ISOLATED AND CONTROL TRANSFERED TO THE REMOTE SHUTDOWN PANEL C61-P001.
11. ELECT. HEAT TRACING: 20 WATTS/LIN. FT., CHEMELEX, TYPE 8ATV1 WITH 34 AWG S.S. OVERSHIELD OR EQUAL.
12. VALVES WILL CLOSE ON SW PUMP SHUT DOWN.
13. THESE COMPUTER INPUT POINTS ARE NOT USED.
14. VALVE EQUIPPED WITH MECHANICAL THROTTLE POSITION LOCK.
15. THE 3/8" DRAIN THREAD-O-LETS ON THE INLET NOZZLES OF PRA-FC-1A AND 1B ARE TO BE PLUGGED. COILS PRA-CC-1A AND PRA-CC-1B MAY BE DRAINED BY USING VALVES SW-V-154F AND SW-V-154G RESPECTIVELY.
16. ON ISOLATION SIGNALS FA, SW-V-69A AND B AND SW-V-70A AND B SHUT AND SW-V-12A AND B OPEN.
17. ALL PIPING DOWNSTREAM OF THE LAST ISOLATION VALVE AND OPEN TO THE ATMOSPHERE WITH THE SUBSYSTEM DESIGNATION "SYSTEM"(50) THRU (59) SHALL BE CLASSIFIED AS CODE GROUP D WITH QUALITY CLASS AND SEISMIC CATEGORY PROVIDED BY THE APPLICABLE NOTES ON THIS DRAWING.

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.

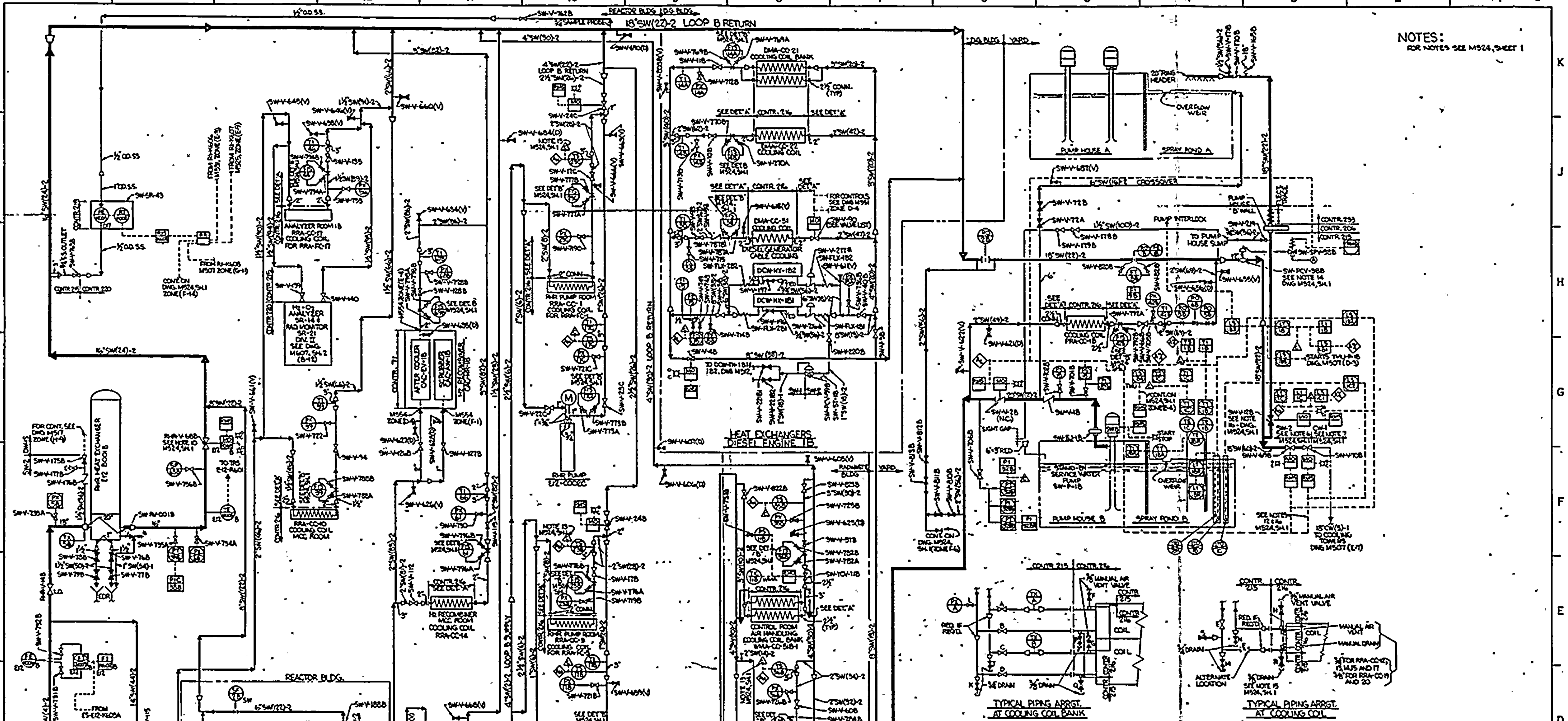
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

FLOW DIAGRAM
STANDBY SERVICE WATER SYSTEM
REACTOR, RADWASTE, DG BLDG'S AND YARD

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

REV. NO.	REVISION	DATE	DRWN	CHKD		
30	FOR PREVIOUS REVISIONS SEE M524. REVISION 29. PER TASK 4110-FEDRMAN	[illegible]	REP	JEP	GMP	3/76

SCALE NONE
DRWN REP
CHKD JEP
GAM
4/26/82
3/11/82
W.O. 2808
DWG. M524, SH.1 30



VALVE LIST												
COOLING COIL NO.	SW-V	SW-V	SW-V	SW-V	SIZE	SW-V	SW-V	SW-V	SW-V	SW-V	SW-V	SW-V
	A	B	C	D	—	E	G	K	J	L	P	Q
DMA-CC-31	100	101	102	103	2½"	141	142	143	144	757A	157	158
DMA-CC-11	104A	105A	106A	107A	2½"	145A	146A	147A	148A	757B	159A	160A
DMA-CC-21	104B	105B	106B	107B	2½"	145B	146B	147B	148B	757C	159B	160B
WMA-CC-52B-1	108B	109B	110B	111B	2"	149B	150B	151B	152B	757D	161B	162B
WMA-CC-52A-1	108A	109A	110A	111A	2"	149A	150A	151A	152A	757E	161A	162A
WMA-CC-51B-1	104C	105C	106C	107C	2½"	145C	146C	147C	148C	757F	159C	160C
WMA-CC-51A-1	104D	105D	106D	107D	2½"	145D	146D	147D	148D	757G	159D	160D

VALVE LIST							
COOLING COIL NO.	SW-V	SIZE	SW-V	SW-V	SW-V	SW-V	SW-V
	E	—	H	M	N	R	S
DMA-CC-12	8A	2"	153A	154A	155A	156A	679(V)
DMA-CC-22	8B	2"	B	B	B	B	680(V)
DMA-CC-52	85	2"	C	C	C	C	—
DMA-CC-51	90	2"	D	D	D	D	—
RRA-CC-1	16C	2"	E	E	E	E	664(V)
RRA-CC-1A	65A	2"	F	F	F	F	—
RRA-CC-1B	65B	2"	G	G	G	G	—
RRA-CC-2	16A	2"	H	H	H	H	642(V)
RRA-CC-3	16B	2"	J	J	J	J	635(V)
RRA-CC-4	46	2"	K	K	K	K	—
RRA-CC-5	36	2"	L	L	L	L	—
RRA-CC-6	26	1½"	M	M	M	M	—
RRA-CC-10	91	1½"	N	N	N	N	—
RRA-CC-11	95	1½"	P	P	P	P	815(V)
RRA-CC-12	97	1½"	R	R	R	R	—
RRA-CC-13	114	2"	S	S	S	S	—
RRA-CC-14	112	2"	T	T	T	T	—
WMA-CC-52A-1	59A	2"	U	U	U	U	—
WMA-CC-52B-1	59B	2"	V	V	V	V	—
RRA-CC-15	152	1½"	W	W	W	W	—
RRA-CC-17	134	1½"	X	X	X	X	—
RRA-CC-19	139	1½"	Y	Y	Y	Y	—
RRA-CC-20	193	1½"	Z	Z	Z	Z	—

INSTRUMENT LIST			
COOLING COIL NO.	SW-TX-		SW-PX
	A	B	A
DMA-CC-31	50A	50B	45A
DMA-CC-11	51A	51B	46A
DMA-CC-21	52A	52B	47A
WMA-CC-52B-1	53A	53B	48A
WMA-CC-52A-1	54A	54B	49A
WMA-CC-51B-1	55A	55B	50A
WMA-CC-51A-1	56A	56B	51A

DETAIL "A"

REV. NO.	REVISION	DATE	DRWN	CHKD	APPROVED
30	FOR PREVIOUS REVISIONS SEE M524, REVISION 29 PER TASK 4110 - REDRAWN	4/4/82	REP	JEP	

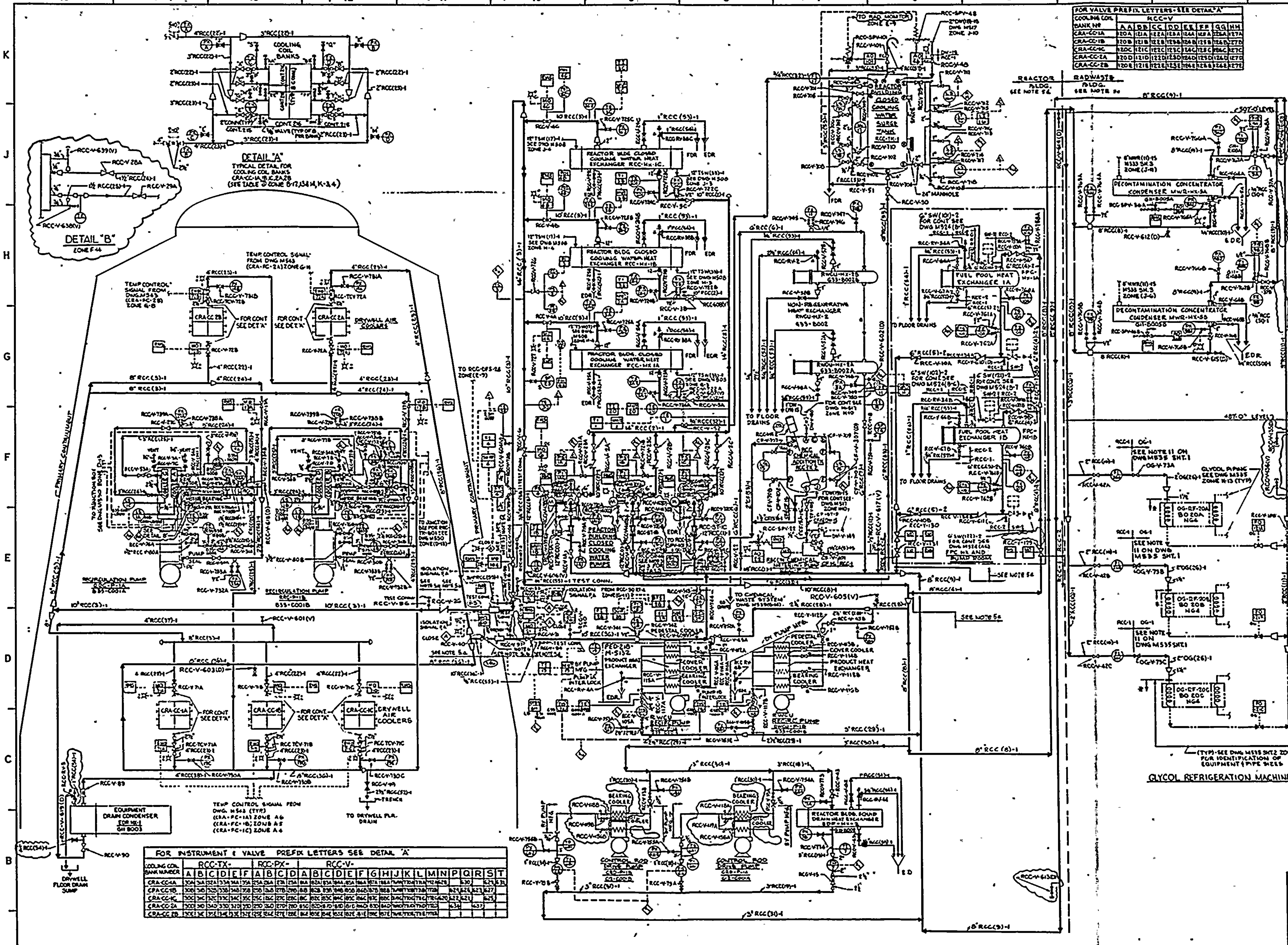
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

FLOW DIAGRAM
STANDBY SERVICE WATER SYSTEM
REACTOR, RADWASTE, D.G. BLDG'S AND YARD

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE
DRWN REP CHKD JEP
W.O. 2108
DWG. M524, SH. 2 30

5/7/82



FOR INSTRUMENT & VALVE PREFIX LETTERS SEE DETAIL "A"																												
COOLING COIL BANK NUMBER	RCC-TX-						RCC-PX-				RCC-V-																	
	A	B	C	D	E	F	A	B	C	D	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
CRA-CC-1A	30A	31A	32A	33A	34A	35A	25A	26A	27A	28A	81A	82A	83A	84A	85A	86A	87A	88A	[illegible]	[illegible]	[illegible]	712A	628		630		629	631
CRA-CC-1B	30B	31B	32B	33B	34B	35B	25B	26B	27B	28B	81B	82B	83B	84B	85B	86B	87B	88B	[illegible]	[illegible]	[illegible]	712B		624	626	623	627	
CRA-CC-1C	30C	31C	32C	33C	34C	35C	25C	26C	27C	28C	81C	82C	83C	84C	85C	86C	87C	88C	709C	710C	711C	712C	620	622	621		625	
CRA-CC-2A	30D	31D	[illegible]	33D	[illegible]	[illegible]	25D	26D	27D	28D	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	84D	[illegible]	[illegible]	[illegible]	712D		634		637		
CRA-CC-2B	30E	31E	[illegible]	[illegible]	[illegible]	[illegible]	25E	26E	27E	28E	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	712E						

GENERAL NOTES

1. ALL TEMPERATURE WELL CONNECTION TO BE 1½" INCH NPT UNLESS SPECIFICALLY NOTED OTHERWISE.
2. ALL INSTRUMENTATION ON THIS DRAWING TO BE IDENTIFIED BY PREFIX "RCC", UNLESS SPECIFICALLY NOTED OTHERWISE.
3. ALL INSTRUMENT ROOT VALVES NOT LABELED WILL BE ¾" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
4. ALL ITEMS MARKED ◇ ARE FURNISHED WITH ASSOCIATED EQUIPMENT.
5. PIPING AND VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING SHALL BE CLASSIFIED AS FOLLOWS EXCEPT AS STATED IN NOTE 8 (BREAK POINTS ARE INDICATED ON THE FLOW DIAGRAM)
   a. INSIDE PRIMARY CONTAINMENT BEYOND THE INNERMOST CONTAINMENT ISOLATION VALVES
      SEISMIC CATEGORY II ●
      QUALITY CLASS II
      CODE GROUP C
   b. PRIMARY CONTAINMENT ISOLATION VALVES AND ALL PIPING AND VALVES BETWEEN THESE ISOLATION VALVES
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP B
   c. THE RADWASTE BLDG STARTING FROM THE REACTOR BUILDING WEST WALL
      SEISMIC CATEGORY II
      QUALITY CLASS II
      CODE GROUP D
   d. ALL PIPING, VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING, IN THE RCC SYSTEM, IN THE REACTOR BUILDING, SHALL BE CLASSIFIED AS FOLLOWS EXCEPT AS NOTED:
      SEISMIC CATEGORY II ●
      QUALITY CLASS II
      CODE GROUP D
      ● SEE SECTION 15.2, CONTRACT 215
   e. ALL PIPING, VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING EXCEPT AS NOTED ABOVE.
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP C
6. THESE VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL".
7.
8. ALL PIPING DOWNSTREAM OF THE LAST ISOLATION VALVE AND OPEN TO THE ATMOSPHERE WITH THE SUBSYSTEM DESIGNATION "SYSTEM" (50) THRU (59) SHALL BE CLASSIFIED AS CODE GROUP D WITH QUALITY CLASS AND SEISMIC CATEGORY PROVIDED BY THE APPLICABLE NOTES ON THIS DRAWING.

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A ¾" VENT VALVE EXCEPT AS NOTED
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A ¾" DRAIN VALVE

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

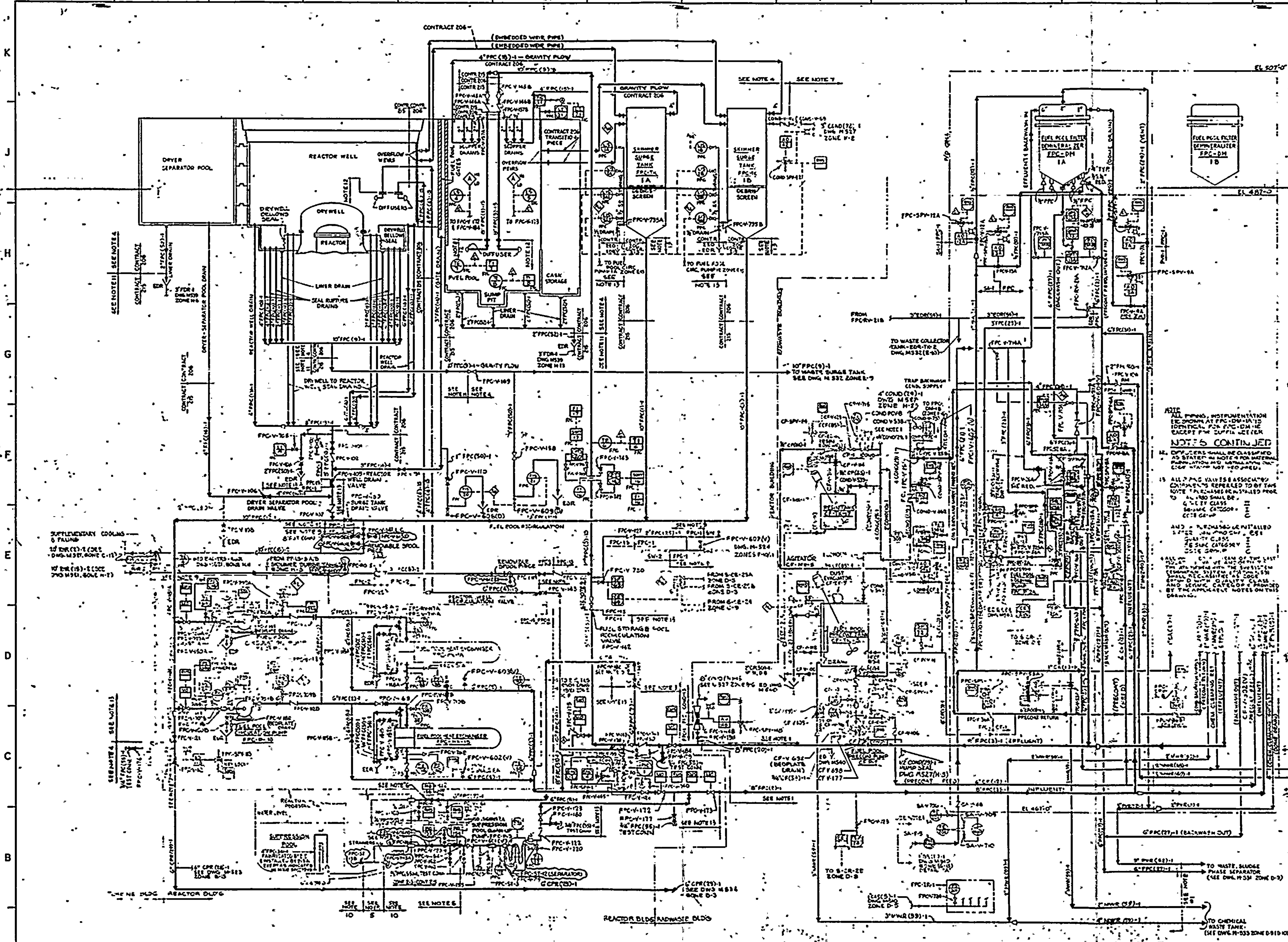
FLOW DIAGRAM
CLOSED COOLING WATER SYSTEM
REACTOR AND RADWASTE BUILDING

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE

W.O. 2808

REV	REVISION	DATE	DRWN	CHKD
25	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE. PER TASK 3040-PED-215-0-367			
26	PER TASK 3040-PED-215-M-A904			



NOTES

1. ALL EQUIPMENT, VALVES, SPECIALTIES, AND INSTRUMENTATION UPSTREAM OF DEWL WASTE AND WASTE SLUDGE PHASE SEPARATOR TANKS AND DOWNSTREAM OF RADWASTE BUILDING PENETRATION SHALL BE FURNISHED UNDER CONTRACT E-2808-20 WITHIN LIMITS SHOWN.
2. ALL PRESSURE SAMPLING AND/OR FLOW INSTRUMENT ROOT VALVES NOT LABLED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE
3. ALL PIPING VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING, EXCEPT AS NOTED IN OTHER NOTES SHALL BE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS II
   SEISMIC CATEGORY II
   CODE GROUP C
4. ALL PIPING ON THIS DRAWING IN THE REACTOR BUILDING, EXCEPT AS NOTED IN THE FOLLOWING NOTES SHALL BE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS II
   SEISMIC CATEGORY II ⊕
   CODE GROUP C
   ⊕ SEE SECTION 15Q CONTRACT 215.
5. ALL PIPING REFERRING TO THIS NOTE SHALL BE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS I
   SEISMIC CATEGORY I
   CODE GROUP B
6. VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL."
7. PIPING, VALVES & COMPONENTS SHOWN ON THIS DRAWING IN THE CPR(29)-1 MWR(38)-1 & MWR(40)-1 SYSTEM SHALL BE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS II
   SEISMIC CATEGORY II ⊕
   CODE GROUP D
   ⊕ SEE SECTION 15Q CONTRACT 215.
8. ALL INSTRUMENTATION PIPING AND TUBING DOWNSTREAM OF THE INSTRUMENT ROOT VALVE SHALL BE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS II
   SEISMIC CATEGORY II } ø
   CODE GROUP C
   ø EXCEPT AS NOTED ON M&R INSTRUMENT CONN DIAGRAMS
9. ALL PIPING, VALVES AND ASSOCIATED COMPONENTS REFERRING TO THIS NOTE SHALL BE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS I
   SEISMIC CATEGORY I
   CODE GROUP C
10. PIPING, VALVES & ASSOCIATED COMPONENTS ON THIS DWG SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON THIS DIAGRAM)
   SEISMIC CATEGORY I
   QUALITY CLASS I
   CODE GROUP C
   # STRAINER SHALL HAVE ALL FABRICATION & MATERIALS TO APPLICABLE REQUIREMENTS OF ASME III-3 EXCEPT CODE STAMP IS NOT REQUIRED ...
11. ALL PIPING FOR FPC ... SHALL HAVE ALL WELDS EXAMINED BY LIQUID PENETRANT EXAMINATION AND SHALL HAVE ALL FABRICATION AND MATERIALS TO APPLICABLE REQUIREMENTS OF ASME III-3, EXCEPT CODE STAMP IS NOT REQUIRED.
   QUALITY CLASS II
   SEISMIC CATEGORY II ●
   CODE GROUP D
   ● SEE SECTION 15Q, CONTRACT 215

FIG. 1
(D-6)

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.

[redacted]

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

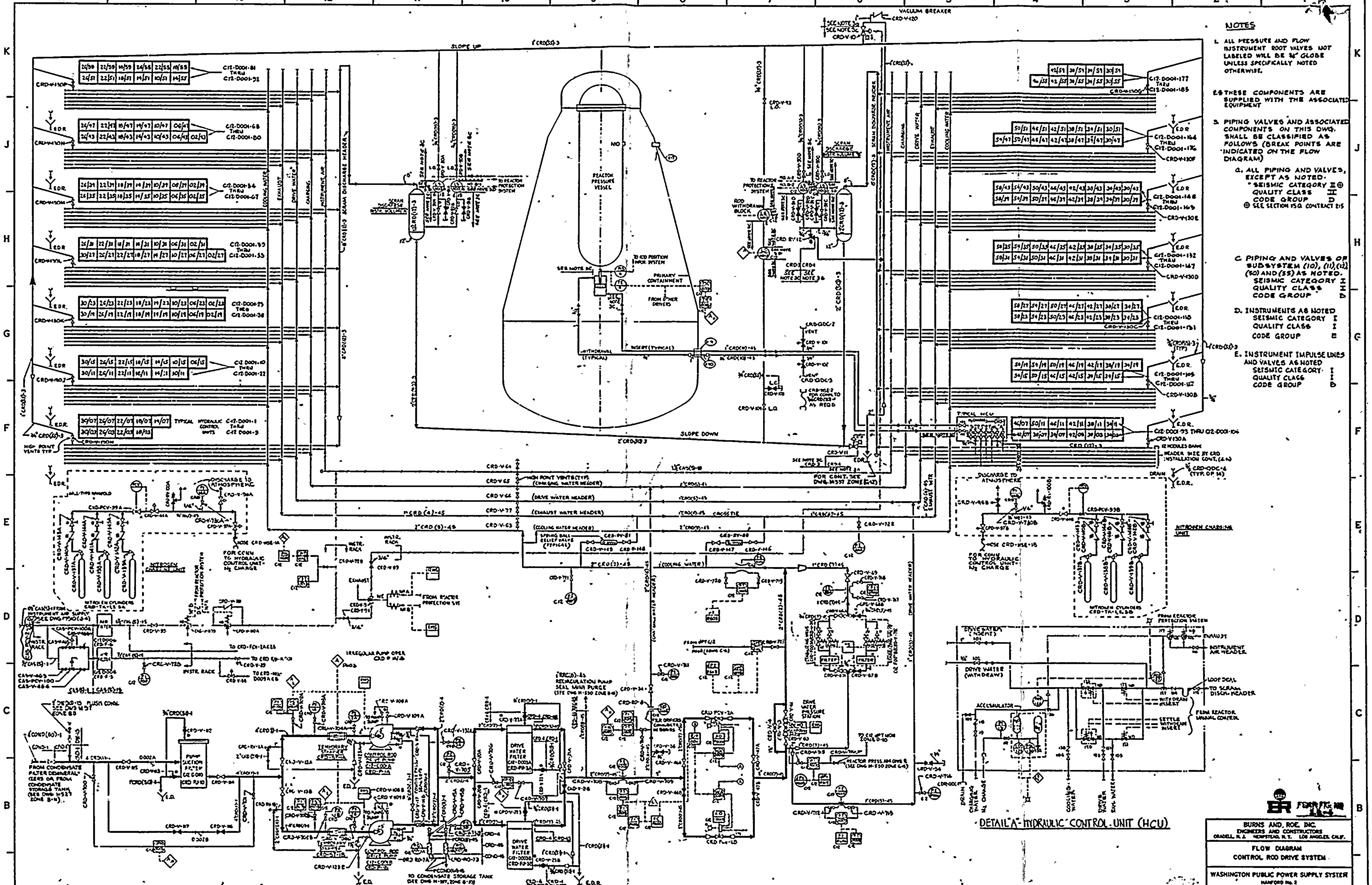
FLOW DIAGRAM
FUEL POOL COOLING
AND CLEAN-UP SYSTEM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE

DWG. M526

REV	REVISION
33	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE. PER TASK 30401 RFI 05-3548 (F-6)
34	PER TASK 3040 ...



NOTES

1. ALL PRESSURE AND FLOW INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE UNLESS SPECIFICALLY NOTED OTHERWISE.

2. ⊕ THESE COMPONENTS ARE SUPPLIED WITH THE ASSOCIATED EQUIPMENT

3. PIPING VALVES AND ASSOCIATED COMPONENTS ON THIS DWG. SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON THE FLOW DIAGRAM)

   a. ALL PIPING AND VALVES, EXCEPT AS NOTED-
      - SEISMIC CATEGORY II ⊕
      - QUALITY CLASS II
      - CODE GROUP D
      - ⊕ SEE SECTION 15Q CONTRACT 215

   C. PIPING AND VALVES OF SUBSYSTEM (10), (11), (12), (50) AND (55) AS NOTED.
      - SEISMIC CATEGORY I
      - QUALITY CLASS I
      - CODE GROUP D

   D. INSTRUMENTS AS NOTED
      - SEISMIC CATEGORY I
      - QUALITY CLASS I
      - CODE GROUP E

   E. INSTRUMENT IMPULSE LINES AND VALVES AS NOTED
      - SEISMIC CATEGORY I
      - QUALITY CLASS I
      - CODE GROUP D

REV	REVISION	DATE
24	PER TASK 3040: PED W215-I-A580 (D-15)	7/1/82
21	PER TASK 8300 ADDED PED'S 215-M-9408 (E-H15) 215-M-3603 (C,D-15)	
22	PER TASK 3040: PED'S 215-D-A069 (D-14) 215-M-5278 (E-F-6)	
23	PER TASK 3040: PED 215-M-A156 (F-8).	
19	FOR REVISION 18 SEE RECORD MAC. PER TASK 8300: ADDED PED'S 215-M-2786 (D-11), 215-M-2120 (B-6,7,8,9,10,11,12, 14, C-7,8,9,12,13, D-6,7,8,12, E-H,13)	
20	PER TASK 8300: ADDED PED'S 215-M-2685 (D-10/11 C-10/11); 215-M-0417 (B-6 (E-6)) 215-M-2717 (D-12 & E-11, E-15)	

FSAR FIG. NO.

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

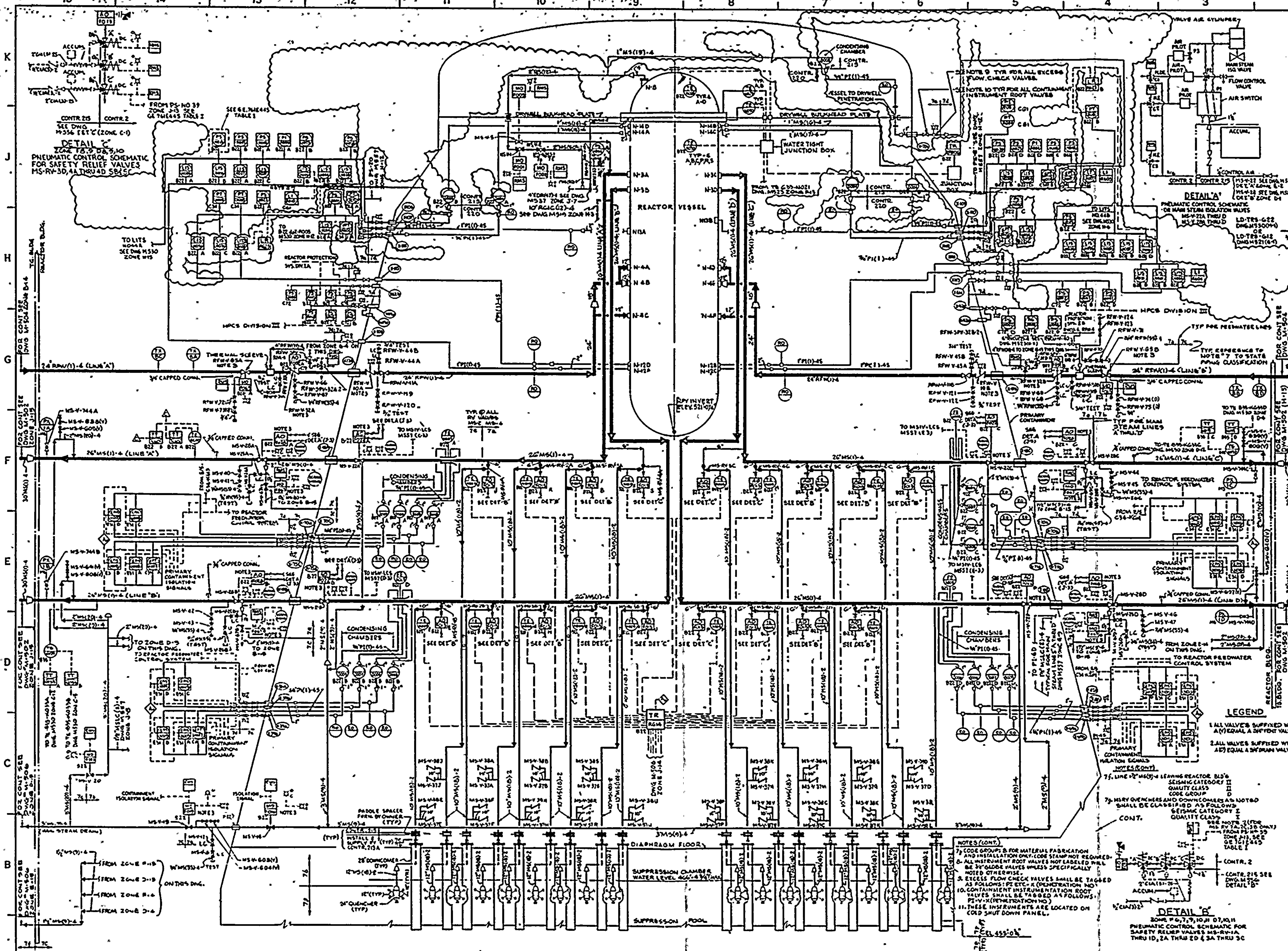
FLOW DIAGRAM
CONTROL ROD DRIVE SYSTEM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE

W.O. 2808

DWG. M 528 24



NOTES

1. FOR ALL INITIATION SIGNALS SEE G.E. NUCLEAR BOILER SYSTEM 822-1040, DOCUMENT NR 761E44", TABLE IX & X
2. THIS EQUIPMENT IS NORMALLY CONTROLLED FROM THE MAIN CONTROL ROOM. IF THE MAIN CONTROL ROOM MUST BE VACATED, THIS CONTROL POINT MAY BE ISOLATED AND CONTROL TRANSFERRED TO THE REMOTE SHUTDOWN PANEL C61-P001
3. THESE VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL."
4. ALL PIPING SYSTEMS IDENTIFIED BY THE PREFIX "PI" SHALL BE SUPPLIED AND INSTALLED BY CONTRACT #220
5. DETAIL SHOWS VALVE LEAK-OFF CONNECTION WITH LEAK DETECTION

7. PIPING, VALVES & ASSOCIATED COMPONENTS ON THIS DWG. SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON THE FLOW DIAGRAM):
   a. PROCESS (FEEDWATER OR STEAM) AND INSTRUMENT PIPING WITHIN THE PRIMARY CONTAINMENT AND OUT THROUGH THE OUTER-MOST ISOLATION VALVES, EXCEPT SAFETY/RELIEF-VALVE DISCHARGE.
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP A
   b. MAIN STEAM PROCESS PIPING BEYOND THE OUTERMOST ISOLATION VALVES, EXCEPT BRANCH LINES (DRAIN) BEYOND THE FIRST VALVE AND SAFETY/RELIEF VALVE DISCHARGE AS NOTED
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP B
   c. FEEDWATER PROCESS PIPING BEYOND THE OUTERMOST ISOLATION VALVES, STEAM PROCESS PIPING (DRAIN) NOT INCLUDED UNDER NOTE 7b., AND VENT, DRAIN AND LEAK-OFF PIPING BEYOND THE LAST VALVE
      SEISMIC CATEGORY II
      QUALITY CLASS II
      CODE GROUP D
   d. INSTRUMENT PIPING BEYOND THE OUTER-MOST ISOLATION VALVES, AND INSTRUMENT PIPING CONNECTED TO THE PRIMARY CONTAINMENT, AIR ACCUMULATORS AND ASSOCIATED PIPING OUT THROUGH THE SUPPLY CHECK VALVE, VENT, DRAIN AND LEAK-OFF PIPING 3/4" OR SMALLER OUT THROUGH THE LAST VALVE
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP B
   e. OTHER AIR PIPING, DOWNCOMERS AND SAFETY/RELIEF VALVE DISCHARGE AS NOTED
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP C
      CODE STAMP NOT REQUIRED FOR DOWNCOMERS
      SEE SECTION 15Q, CONTRACT 215

LEGEND

1. ALL VALVES SUFFIXED WITH A(V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A(D) EQUAL A 3/4" DRAIN VALVE.

NOTES (CONT.)

7f. CODE GROUP: B FOR MATERIAL FABRICATION AND INSTALLATION ONLY. CODE STAMP NOT REQUIRED.
8. ALL INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
9. EXCESS FLOW CHECK VALVES SHALL BE TAGGED AS FOLLOWS: PI ETC.-X (PENETRATION NO)
10. CONTAINMENT INSTRUMENTATION ROOT VALVES SHALL BE TAGGED AS FOLLOWS: PI-V-X (PENETRATION NO)
11. THESE INSTRUMENTS ARE LOCATED ON COLD SHUT DOWN PANEL.

DETAIL "A" [illegible]

DETAIL "C" [illegible]

REV NO	REVISION	DATE
	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE	
27	PER TASK 3040: PED's 215-M-4607-(F-G-2,G-2,J-1-2) 220-I-4920(4-5) 215-M-A039(F-G-13,-14, F-G-3-4)	
28	PER TASK 3040-PED-W220-I-0627 [illegible]	
29	PER TASK 3040-PED'S-W220-I-0702 [illegible]	

FSAR FIG. NO. 3.2-2

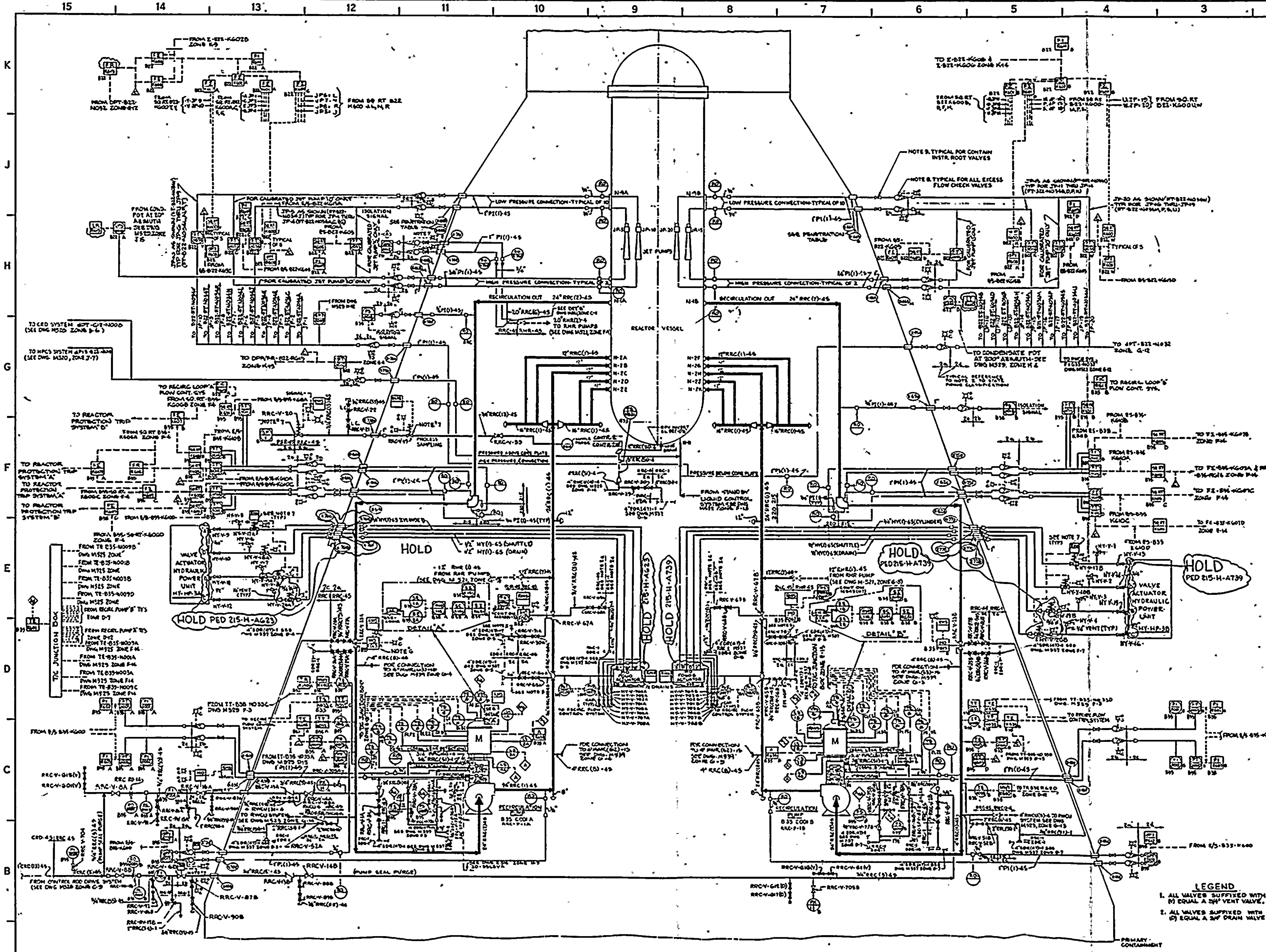
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

FLOW DIAGRAM
NUCLEAR BOILER-MAIN STEAM SYSTEM
REACTOR BUILDING

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No 2

SCALE NONE
PAL
BSS
5-9-72

W.O. 2808
DWG. M529



NOTES:

1. ALL ITEMS MARKED ● ARE FURNISHED WITH ASSOCIATED EQUIPMENT.
2. PIPING, VALVES AND ASSOCIATED COMPONENTS ON THIS DWG. SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON FLOW DIAGRAM):
   a. PIPING AND VALVES OF SUBSYSTEM RRC (1), (2) AND (3) AND INSTRUMENT PIPING AND VALVES AS NOTED
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP A
   b. PIPING AND VALVES OF SUBSYSTEM HY(1) AND INSTRUMENT AND PROCESS PIPING AND VALVES AS NOTED:
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP B
   c. INSTRUMENT AND PROCESS PIPING AND VALVES AS NOTED
      SEISMIC CATEGORY I-● } ¢
      QUALITY CLASS I
      CODE GROUP D
   d. PUMP SEAL DRAIN LINES AND INSTRUMENT PIPING AS NOTED
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP C
   ● SEE SECT. 15Q CONTRACT 215
3. ALL INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
4. ALL PIPING SYSTEMS IDENTIFIED BY THE PREFIX "PI-STSR" SHALL BE SUPPLIED AND INSTALLED BY CONTRACT #220
5. DETAIL SHOWS VALVE STEM LEAK-OFF CONNECTION WITH LEAK DETECTION

JET PUMP TRANSMITTER L.P. SENSING LINE PENETRATION TABLE			
PUMP Nº	INSTR. PENETR. Nº	FT-Nº	FT-Nº
JP-1	X-44Ba	FT-B22-N034A	—
JP-2	X-44Bb	FT-B22-N034C	—
JP-3	X-44Bc	FT-B22-N034E	—
JP-4	X-44Bd	FT-B22-N034G	—
JP-5	X-44Be	FT-B22-N034J	FT-B22-N036A
JP-6	X-44Bf	FT-B22-N034L	—
JP-7	X-44Bg	FT-B22-N034N	—
JP-8	X-44Bh	FT-B22-N034R	—
JP-9	X-44Bj	FT-B22-N034T	—
JP-10	X-44BK	FT-B22-N034V	FT-B22-N035C
JP-11	X-44Aa	FT-B22-N034B	—
JP-12	X-44Ab	FT-B22-N034D	—
JP-13	X-44Ac	FT-B22-N034F	—
JP-14	X-44Ad	FT-B22-N034H	—
JP-15	X-44Ae	FT-B22-N034K	FT-B22-N0330
JP-16	X-44Af	FT-B22-N034M	—
JP-17	X-44Ag	FT-B22-N034P	—
JP-18	X-44Ah	FT-B22-N034S	—
JP-19	X-44Aj	FT-B22-N034U	—
JP-20	X-44AK	FT-B22-N034W	FT-B22-N0330

6. THIS EQUIPMENT IS NORMALLY CONTROLLED FROM THE MAIN CONTROL ROOM. IF THE MAIN CONTROL ROOM MUST BE VACATED, THIS CONTROL POINT MAY BE ISOLATED AND CONTROL TRANSFERRED TO THE REMOTE SHUT-DOWN PANEL C61-P001
7. THESE VALVES WILL BE INCLUDED IN THE ISOLATION VALVE POSITION DISPLAY PANEL.
8. EXCESS FLOW CHECK VALVES SHALL BE TAGGED AS FOLLOWS:
   PI-EFC-X(PENETRATION NO.)
9. CONTAINMENT INSTRUMENTATION ROOT VALVE SHALL BE TAGGED AS FOLLOWS:
   PI-V-X(PENETRATION NO)

Ø EXCEPT AS NOTED ON M&IR INSTRUMENT CONNECTION DIAGRAMS

10. ALL INSTRUMENTATION ON THIS DRAWING TO BE IDENTIFIED BY PREFIX "RRC" UNLESS SPECIFICALLY NOTED OTHERWISE.

ON HOLD
PED 215-H-A623
PED 215-H-A739

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.

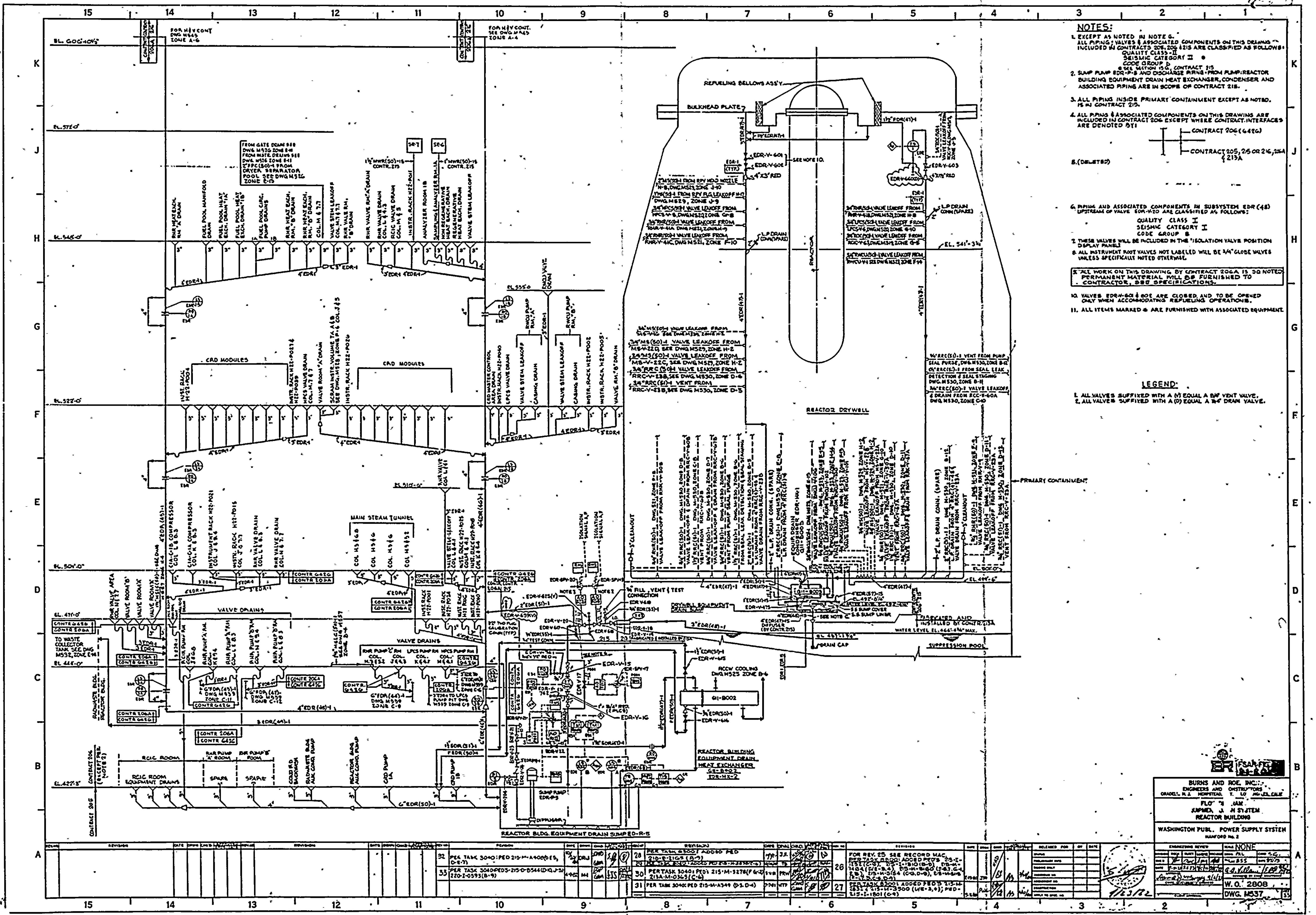
REV. NO.	REVISION
27	PER TASK 3040 PEDS-220-I-0629(H-5,H-15) 220-I-0593(K-15)
24	PER TASK 3040: PED 218-E-2716 (H-11)
25	PER TASK 3040 PED 220-I-0509 (F-7, F-11)
26	PER TASK 3040 PED'S 215-M-A400(D-12, D-5, B-13, B-4-3) 215-M-A44 215-M-A016(G-10-11, F-6-7)
21	[illegible]
22	PER TASK 8200: ADDED PED 220-I-0548 (C-13 & C-4).
23	PER TASK 8200?, ADDED PCN 7002 & PED 220-M-3099 (B, F-6) 220-E-0416
19	FOR REVISION 16 SEE RECORD M.A.C. PER TASK A300: DELETED PED 215-M-105 FROM REV. 18. THIS DRAWING PER PED 215-M-1116 (A-8, B-12, B, C-12) 215-M-9129 (C-8, 4, 13, D-6, 11, 12)
20	PER TASK 8300: ADDED PED'S [illegible]
21	[illegible] ADDED PED 215-M-[illegible]

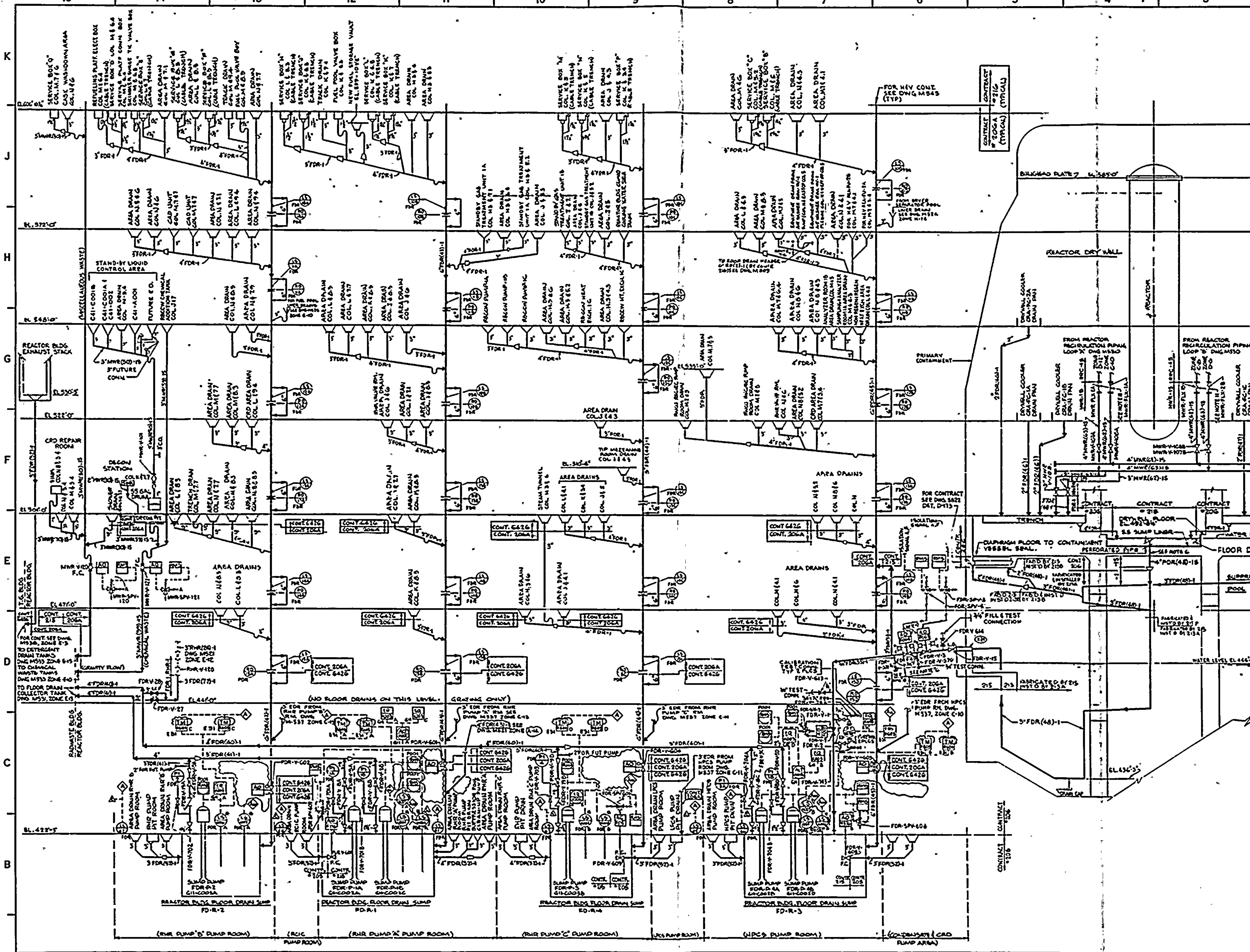
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

FLOW DIAGRAM
NUCLEAR BOILER
RECIRCULATION SYSTEM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE
DRN. AB
CHKD. BSS
DATE 2/6/7?
W.O. 2808
DWG. M530 27


NOTES:
1. EXCEPT AS NOTED IN NOTE 6.
ALL PIPING, VALVES & ASSOCIATED COMPONENTS ON THIS DRAWING INCLUDED IN CONTRACTS 205, 206 & 215 ARE CLASSIFIED AS FOLLOWS:
QUALITY CLASS - II
SEISMIC CATEGORY II
CODE GROUP D
SEE SECTION 15G, CONTRACT 215
2. SUMP PUMP EDR-P-5 AND DISCHARGE PIPING FROM PUMP; REACTOR BUILDING EQUIPMENT DRAIN HEAT EXCHANGER, CONDENSER AND ASSOCIATED PIPING ARE IN SCOPE OF CONTRACT 215.
3. ALL PIPING INSIDE PRIMARY CONTAINMENT EXCEPT AS NOTED, IS IN CONTRACT 215.
4. ALL PIPING & ASSOCIATED COMPONENTS ON THIS DRAWING ARE INCLUDED IN CONTRACT 206 EXCEPT WHERE CONTRACT INTERFACES ARE DENOTED BY:
CONTRACT 206 (6426)
CONTRACT 205, 215 OR 216, 206A & 213A
5. (DELETED)
6. PIPING AND ASSOCIATED COMPONENTS IN SUBSYSTEM EDR (48) UPSTREAM OF VALVE EDR-V-20 ARE CLASSIFIED AS FOLLOWS:
QUALITY CLASS I
SEISMIC CATEGORY I
CODE GROUP B
7. THESE VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL"
8. ALL INSTRUMENT ROOT VALVES NOT LABELLED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL WORK ON THIS DRAWING BY CONTRACT 206A IS SO NOTED. PERMANENT MATERIAL WILL BE FURNISHED TO CONTRACTOR, SEE SPECIFICATIONS.
10. VALVES EDR-V-601 & 602 ARE CLOSED AND TO BE OPENED ONLY WHEN ACCOMMODATING REFUELING OPERATIONS.
11. ALL ITEMS MARKED ◆ ARE FURNISHED WITH ASSOCIATED EQUIPMENT.
LEGEND:
1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.
REACTOR DRYWELL
SUPPRESSION POOL
PRIMARY CONTAINMENT
REFUELING BELLOWS ASS'Y
BULKHEAD PLATE
REACTOR
MAIN STEAM TUNNEL
CRD MODULES
VALVE DRAINS
RCIC ROOM
REACTOR BLDG. EQUIPMENT DRAIN SUMP ED-R-15
REACTOR BUILDING EQUIPMENT DRAIN HEAT EXCHANGER
FSAR-FIG
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
FLO" "I .AM
SUPMEN J. N SYSTEM
REACTOR BUILDING
WASHINGTON PUBL. POWER SUPPLY SYSTEM
HANFORD No. 2
SCALE NONE
W. O. 2808
DWG. M537
33



NOTES:

1. EXCEPT AS NOTED IN NOTES 5, 6 & 10, ALL PIPING, VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING INCLUDED IN CONTRACT 205 & 206 ARE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS - II
   SEISMIC CATEGORY II
   CODE GROUP D
2. SUMP PUMPS FDR-P-1A; FDR-P-1B; FDR-P-2; FDR-P-3A; FDR-P-3B; FDR-P-4; AND ALL THE DISCHARGE PIPING FROM PUMPS ARE IN SCOPE OF CONTRACT 215.
3. ALL PIPING INSIDE PRIMARY CONTAINMENT, EXCEPT AS NOTED, IS IN CONTRACT 215.
4. ALL PIPING, VALVE & ASSOCIATED COMPONENTS ON THIS DRAWING ARE INCLUDED IN CONTRACT 206 EXCEPT WHERE CONTRACT INTERFACES ARE DENOTED BY:
   CONTRACT # 215, 203 OR 216, 206A, 213A | CONTRACT # 206 (6426)
5. PIPING & ASSOCIATED COMPONENTS INSIDE THE PRIMARY CONTAINMENT ARE CLASSIFIED AS FOLLOWS: (EXCEPT AS NOTED IN NOTES 6 & 10)
   QUALITY CLASS II
   SEISMIC CATEGORY II ●
   CODE GROUP C
   ● SEE SECTION 15Q, CONTRACT 215
6. PIPING & ASSOCIATED COMPONENTS IN SUBSYSTEM FDR(48) UPSTREAM OF VALVE FDR-V-4 ARE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS I
   SEISMIC CATEGORY I
   CODE GROUP B
7. THESE VALVES WILL BE INCLUDED IN THE ISOLATION VALVE POSITION DISPLAY PANEL.
8. * DENOTES INSTRUMENTS SUPPLIED WITH EQUIPMENT.
9. ALL INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
10. FROM FIRST WELD INSIDE CONTAINMENT UP TO & INCLUDING TEST CONN. BOUNDRY OUTSIDE CONTAINMENT, PIPING MWR(63) & MWR(65) ARE CLASSIFIED AS FOLLOWS:
    QUALITY CLASS I
    SEISMIC CATEGORY I
    CODE GROUP B
11. FLEX CONN'S. ARE INSTALLED ONLY DURING USE, LINE IS NORMALLY BLIND FLANGED.
12. ALL WORK ON THIS DRAWING BY CONTRACT 206A IS SO NOTED. PERMANENT MATERIAL WILL BE FURNISHED TO CONTRACTOR, SEE SPECIFICATIONS.
13. ALL PIPING & ASSOCIATED COMPONENTS ON THIS DRAWING INCLUDED IN CONTRACT 213 DOWNSTREAM OF VALVE FDR-V-4 AND IN SUBSYSTEMS FDR(40) & FDR(41) ARE CLASSIFIED AS FOLLOWS:
    QUALITY CLASS - II
    SEISMIC CATEGORY - II ●
    CODE GROUP - D
    ● SEE SECTION 15Q CONT. 215

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.

FSAR FIG. 9.3-8(a)

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

FLOW DIAGRAM
FLOOR DRAIN SYSTEM
REACTOR BUILDING

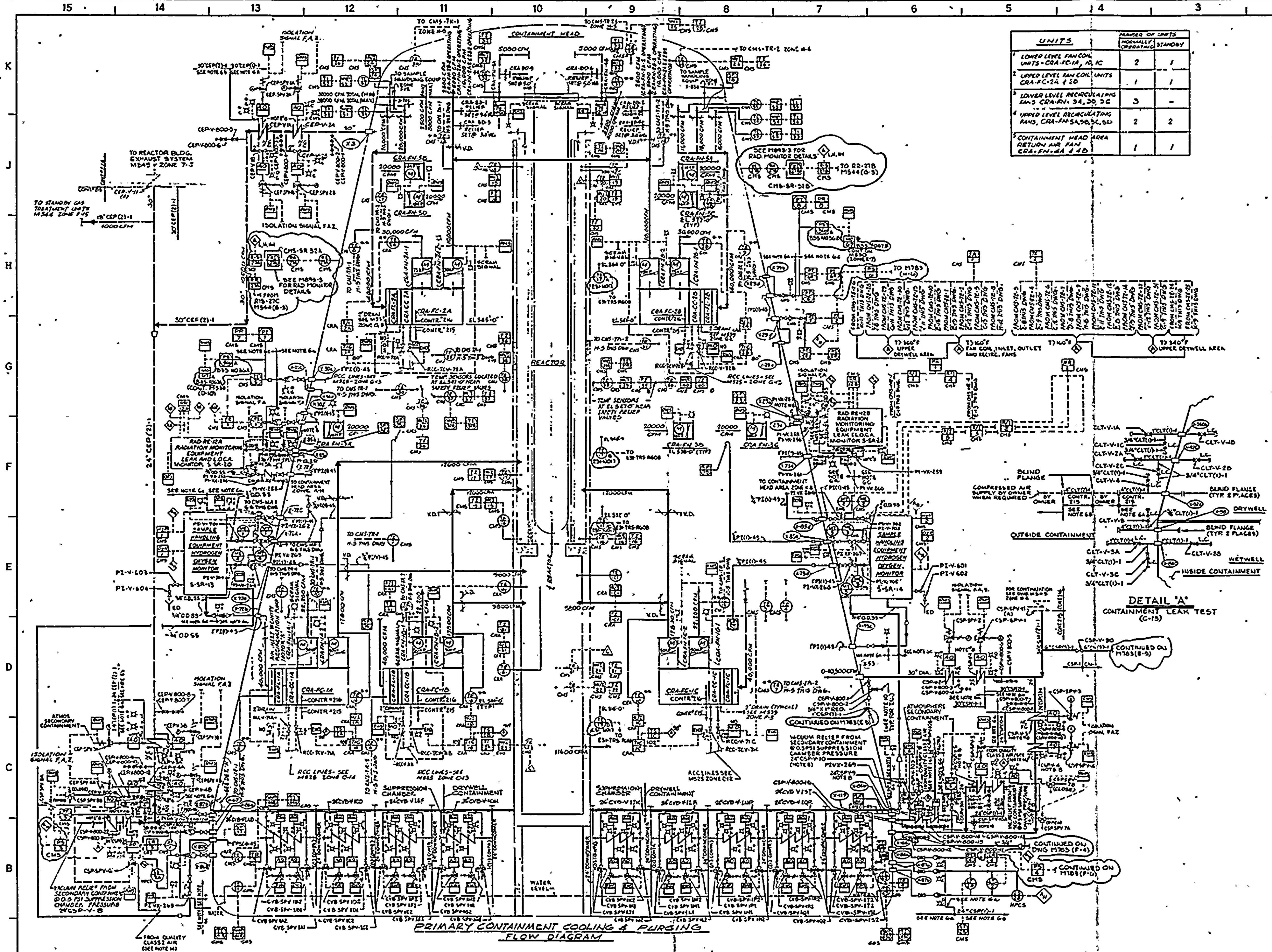
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE

W.O. 2808

DWG. M539

REV. NO.	REVISION	DATE	DRWN.	CHKD.
37	PER TASK 3040-PED3-210-E-3596(B-C-7, B-C-11) 215-M-4029(C-6-7, C-9, C-11, C-13), 215-M-4123(C-10, C-11) 220-I-0593(C-6, C-9, C-10, C-12, C-13, C-14)	4-9-82	MH	
34	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE PER TASK 3040 PED 215-M-4461 (C-7) PED-213A-M-0365 (C-4)		MTP	
35	PER TASK 3040, PED 215-M-4478(C-7-8, C-10, C-13, C-14)			
36	PER TASK 3040 PED 213B-M-0021(E-4-2, D-E-4-5)		DRJ	



PRIMARY CONTAINMENT COOLING & PURGING FLOW DIAGRAM

UNITS	NUMBER OF UNITS NORMALLY OPERATING	STANDBY
1 LOWER LEVEL FAN COIL UNITS - CRA-FC-1A, 1B, 1C	2	1
2 UPPER LEVEL FAN COIL UNITS CRA-FC-2A & 2B	1	1
3 LOWER LEVEL RECIRCULATING FANS CRA-FN-3A, 3B, 3C	3	-
4 UPPER LEVEL RECIRCULATING FANS, CRA-FN-5A, 5B, 5C, 5D	2	2
5 CONTAINMENT HEAD AREA RETURN AIR FAN CRA-FN-4A & 4B	1	1

NOTES:

1- FOR ALL FAN COIL UNITS (FC), THE FILTERS ARE USED ONLY DURING CONSTRUCTION PERIOD.

2- ISOLATION SIGNAL CODES
A - REACTOR VESSEL LOW WATER LEVEL
F - HIGH DRYWELL PRESSURE
Z - HIGH RADIATION, REACTOR BUILDING VENTILATION SYSTEM.

3 - FOR FLOW DIAGRAM LEGEND, SYMBOLS AND ABBREVIATIONS, SEE DRAWING M501.

4 - ALL INSTRUMENTS ON THIS DRAWING TO BE PREFIXED BY "CRA" UNLESS SPECIFICALLY NOTED OTHERWISE, IE (FI 2) IS IDENTIFIED AS "CRA-FI-2

5 - ALL PRESSURE AND FLOW INSTRUMENT ROOT VALVES SHALL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE

6 - PIPING AND VALVES AND ASSOCIATED COMPONENTS ON THIS DWG SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS INDICATED ON FLOW DIAGRAM)
a. PIPING AND VALVES WITHIN PRIMARY CONTAINMENT AND UP TO THE OUTERMOST ISOLATION VALVES
SEISMIC CATEGORY --- I
QUALITY CLASS --- I
CODE GROUP ------ B
b. PIPING AND VALVES BEYOND OUTERMOST ISOLATION VALVE (EXCEPT INSTRUMENT LINES AS NOTED)
SEISMIC CATEGORY --- II } ∅
QUALITY CLASS ---- II } ∅
CODE GROUP ----- D } ∅
c. INSTRUMENT LINES AS NOTED
SEISMIC CATEGORY --- I } ∅
QUALITY CLASS ---- I } ∅
CODE GROUP ---- C } ∅
∅ EXCEPT AS NOTED ON M619 INSTRUMENT CONNECTION DIAGRAMS

7- ALL DUCTWORK WITHIN THE PRIMARY CONTAINMENT SHALL BE CLASSIFIED AS FOLLOWS:
SEISMIC CATEGORY ---- I
QUALITY CLASS ----- I

8- THESE VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL."

9- ALL PIPING SYSTEMS IDENTIFIED BY THE PREFIX "PI" SHALL BE SUPPLIED AND INSTALLED BY CONTRACT #220

10- ALL VALVE TEST CONNECTIONS FOR LINES PENETRATING PRIMARY CONTAINMENT SHALL CONSIST OF 3/4" GLOBE VALVES, WHICH SHALL BE TAGGED AS FOLLOWS:
CSP-V-800-(NUMBER)
CEP-V-800-(NUMBER)

11. RADIATION MONITORING AND SAMPLE HANDLING SYSTEMS (CONTRACT 220). VALVES SHALL BE TAGGED AS FOLLOWS:
a. BLOCK VALVE (*)-V-X (PENETRATION NO)
b. EXCESS FLOW CHECK VALVE, (*)-EFC-X (PENETRATION NO)
c. CHECK VALVE (*)-CV-X (PENETRATION NO)
* USE PI FOR INSTRUMENT LINES AND PSR FOR SAMPLING LINES.

12. ALL TAGS FOR INSTRUMENT ROOT VALVES WILL BE FURNISHED AND INSTALLED BY OWNER.

13 ALL AIR QUANTITIES INDICATED ARE ACTUAL CFM.

14 SEE M619 SHEET 161 FOR THE CONSTRUCTION DETAILS OF THE QUALITY CLASS I INSTRUMENT AIR SYSTEM.

15 ** FURNISHED BY CONTRACT 216, INSTALLED BY OTHERS (CONTRACT 218)

REV NO	REVISION	DATE
27	PER TASK 3040: PED'S 215-M-5312, 215-M-5315 (B-4-5, B-6, H-6-7, B-15, C-6-7, D-4) N220-I-0575 (H-12-13, J-6-8) 215-M-5420 (C-9, E-9, F-9, H-9, D-13-14, H-6-7)	
26	PER TASK 3040: PED-N218-M-5308 (D-3-4, C-D-7, B-4-6), 215-D-6323, 215-I-8196 (E-6-3-5, C-13), 216-B-0769 (C-9-10, D-8, E-8, D-F-8-9, D-F-10-12, D-13, H-8, H-J-8-9, J-8-9, H-11-12, H-12, H-J-10-11, J-11-12, J-K-7-9, K-9, K-11), 220-I-0656 (G-13, H-J-7), 220-I-0593 (D-14, B-8, E-14, G-6), 220-I-0661 (D-9, D-10, E-12)	
24	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE PER TASK 3040: PEDS 220-I-0565 (C-7, F-6) 220-I-0530 (E-F-13, E-F-6-7) 215-B-A180 (J-13, C-14)	
25	PER TASK 3040: PED 220-I-0590 (E-C-6-5) 220-I-0584 (F-12-13, E-13, E-6-7-8)	

FSAR FIG. NO. 9.4-8 (3.2-15)

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

FLOW DIAGRAM - REACTOR BLDG.
PRIMARY CONTAINMENT COOLING AND PURGING SYSTEM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

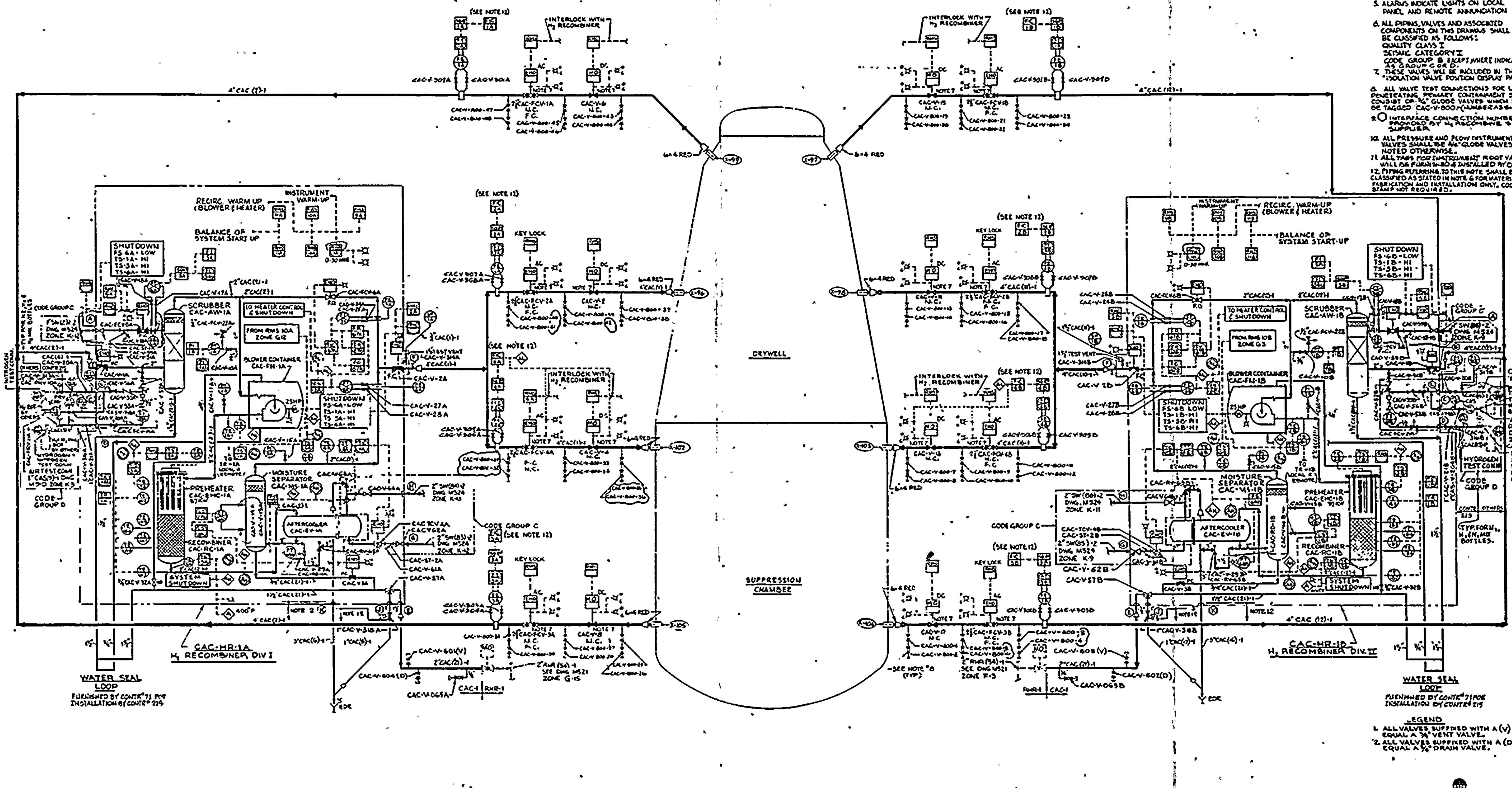
W.O. 2808
DWG. M543 REV 27

CONTINUED

13. CONTRACT 71 FURNISHED INSTRUMENTS ON LOCAL CONTROL PANEL, WITH SUFFIX NUMBERS AS SHOWN FOR FLOW DIAGRAM DEFINITION ONLY AND WILL NOT APPEAR ON THE LOCAL CONTROL PANEL.

NOTES:

1. ALL INSTRUMENTATION ON THIS DRAWING TO BE PREFIXED BY CAC UNLESS SPECIFICALLY NOTED OTHERWISE I.E. (PI 1) IS IDENTIFIED AS CAC-PI-1
2. FOR FLOW DIAGRAM LEGEND, SYMBOLS AND ABBREVIATIONS SEE DRAWING M501.
3. MOTOR OPERATED VALVES (A C ONLY) ARE WITH SLOW CLOSURE TIME (WITH POSITION INDICATOR IN CONTROL ROOM)
4. THE UNITS ARE STARTED FROM MAIN CONTROL ROOM. FOR HYDROGEN AND OXYGEN SAMPLING AND RECORDING SYSTEMS SEE DWG. M543.
5. ALARMS INDICATE LIGHTS ON LOCAL PANEL AND REMOTE ANNUNCIATION
6. ALL PIPING, VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING SHALL BE CLASSIFIED AS FOLLOWS:
   QUALITY CLASS I
   SEISMIC CATEGORY I
   CODE GROUP B EXCEPT WHERE INDICATED AS GROUP C OR D.
7. THESE VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL"
8. ALL VALVE TEST CONNECTIONS FOR LINES PENETRATING PRIMARY CONTAINMENT SHALL CONSIST OF 3/4" GLOBE VALVES WHICH SHALL BE TAGGED CAC-V-800-(NUMBER AS SHOWN)
9. ◯ INTERFACE CONNECTION NUMBER PROVIDED BY H2 RECOMBINER SKID SUPPLIER
10. ALL PRESSURE AND FLOW INSTRUMENT ROOT VALVES SHALL BE 3/4" GLOBE VALVES UNLESS NOTED OTHERWISE.
11. ALL TAGS FOR INSTRUMENT ROOT VALVES WILL BE FURNISHED & INSTALLED BY OWNER
12. PIPING REFERRING TO THIS NOTE SHALL BE CLASSIFIED AS STATED IN NOTE 6 FOR MATERIAL FABRICATION AND INSTALLATION ONLY. CODE STAMP NOT REQUIRED.



CONTAINMENT ATMOSPHERE CONTROL SYSTEM

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.

FSAR FIG NO 32-17

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

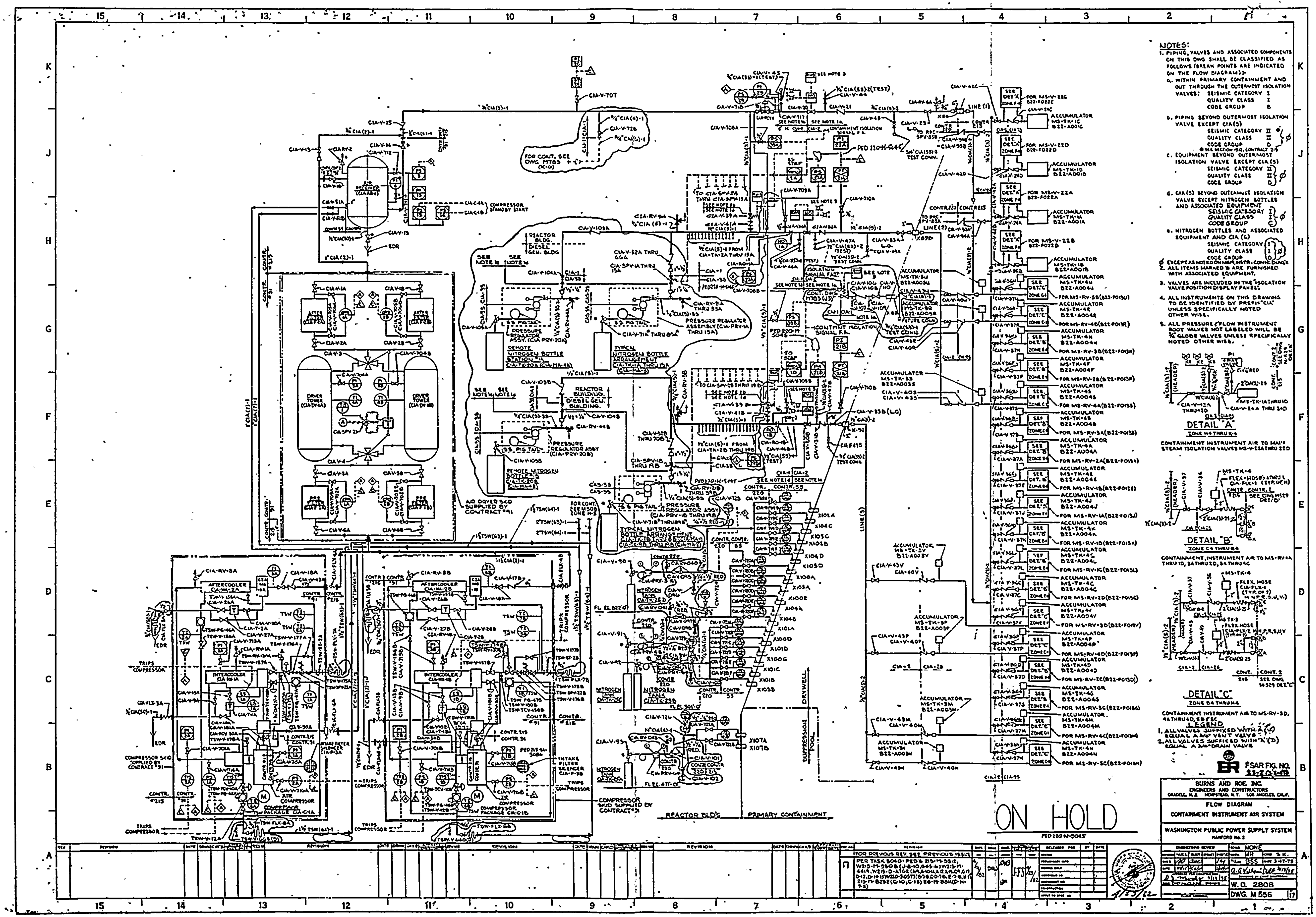
FLOW DIAGRAM - H&V
CONTAINMENT ATMOSPHERE CONTROL SYSTEM
REACTOR BLDG.

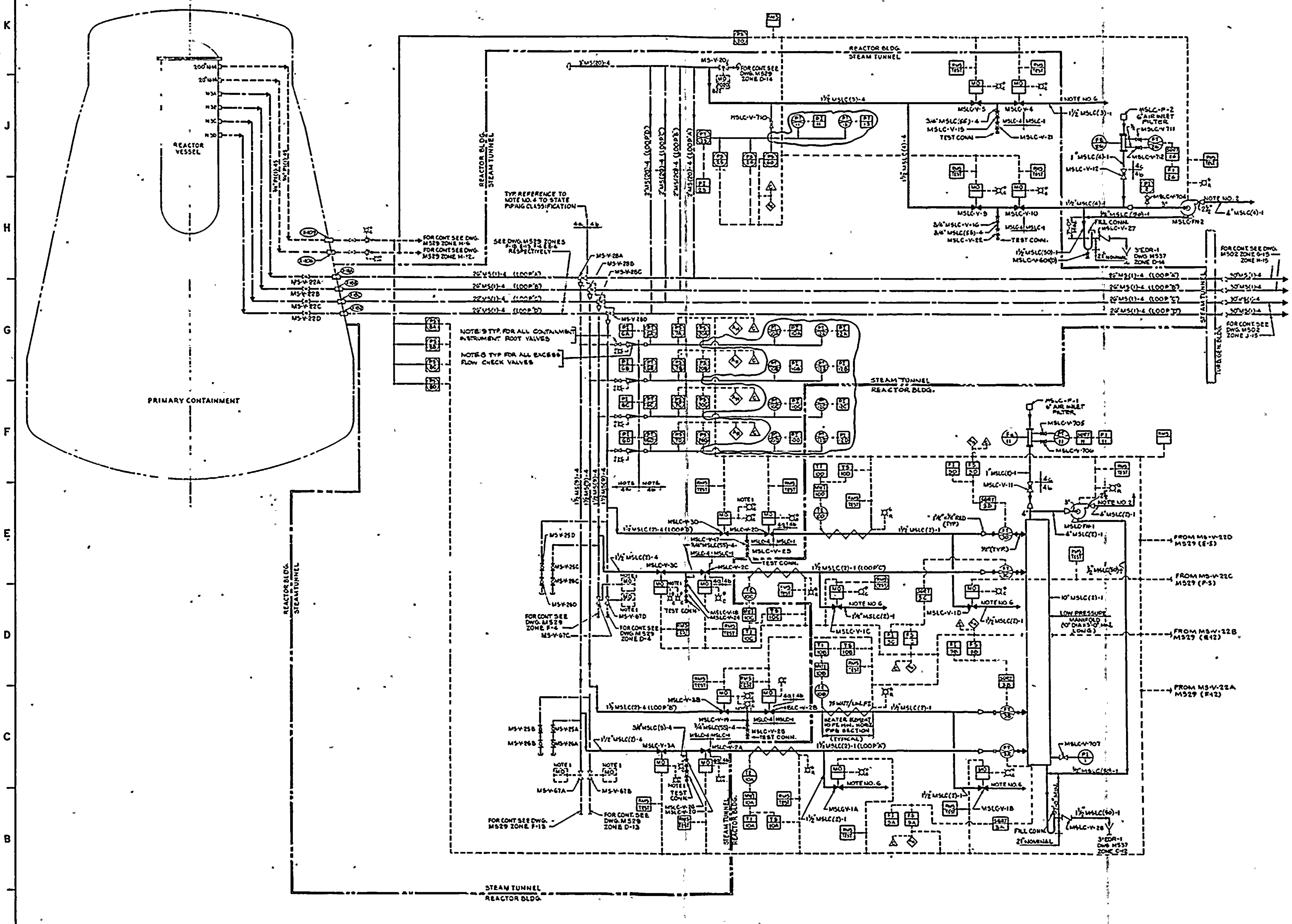
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE

W.O. 2808

DWG. M554 21


NOTES:
1. PIPING, VALVES AND ASSOCIATED COMPONENTS ON THIS DWG SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON THE FLOW DIAGRAM):
a. WITHIN PRIMARY CONTAINMENT AND OUT THROUGH THE OUTERMOST ISOLATION VALVES: SEISMIC CATEGORY I QUALITY CLASS I CODE GROUP B
b. PIPING BEYOND OUTERMOST ISOLATION VALVE EXCEPT CIA(S) SEISMIC CATEGORY II QUALITY CLASS II CODE GROUP D
SEE SECTION 15Q, CONTRACT 215
c. EQUIPMENT BEYOND OUTERMOST ISOLATION VALVE EXCEPT CIA(S) SEISMIC CATEGORY II QUALITY CLASS II CODE GROUP D
d. CIA(S) BEYOND OUTERMOST ISOLATION VALVE EXCEPT NITROGEN BOTTLES AND ASSOCIATED EQUIPMENT SEISMIC CATEGORY I QUALITY CLASS I CODE GROUP C
e. NITROGEN BOTTLES AND ASSOCIATED EQUIPMENT AND CIA (G) SEISMIC CATEGORY I QUALITY CLASS I CODE GROUP D
Ø EXCEPT AS NOTED ON MSM, INSTR. CONN. DIAG'S
2. ALL ITEMS MARKED ARE FURNISHED WITH ASSOCIATED EQUIPMENT.
3. VALVES ARE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL".
4. ALL INSTRUMENTS ON THIS DRAWING TO BE IDENTIFIED BY PREFIX "CIA" UNLESS SPECIFICALLY NOTED OTHER WISE.
5. ALL PRESSURE & FLOW INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHER WISE.
DETAIL "A"
ZONE H4 THRU K4
CONTAINMENT INSTRUMENT AIR TO MAIN STEAM ISOLATION VALVES MS-V-22A THRU 22D
DETAIL "B"
ZONE C4 THRU G4
CONTAINMENT INSTRUMENT AIR TO MS-RV-4A THRU 1D, 2A THRU 2D, 3A THRU 3C
DETAIL "C"
ZONE B4 THRU C4
CONTAINMENT INSTRUMENT AIR TO MS-RV-3D, 4A THRU 4D, 5B & 5C
LEGEND
1. ALL VALVES SUFFIXED WITH "V" EQUAL A 3/4" VENT VALVE
2. ALL VALVES SUFFIXED WITH "X" (D) EQUAL A 3/4" DRAIN VALVE
AIR DRYER SKID SUPPLIED BY CONTRACT #91
COMPRESSOR SKID SUPPLIED BY CONTRACT #91
REACTOR BLD'G
PRIMARY CONTAINMENT
SUPPRESSION POOL
DRYWELL
ON HOLD
FSAR FIG. NO.
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.
FLOW DIAGRAM
CONTAINMENT INSTRUMENT AIR SYSTEM
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2
SCALE NONE
W.O. 2808
DWG. M 556
17



NOTE:

1. THESE VALVES ARE INCLUDED IN THE ISOLATION VALVE POSITION DISPLAY PANEL.
2. EXHAUST TO WITHIN 5'-0" TO 10'-0" OF STANDBY GAS TREATMENT SYSTEM INLET.
3. ALL PRESSURE AND FLOW INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE UNLESS SPECIFICALLY NOTED OTHERWISE.
4. PIPING, VALVES & ASSOCIATED COMPONETS ON THIS DWG SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON THE FLOW DIAGRAM):
   a) PROCESS AND INSTRUMENT PIPING 3/4" AND LARGER WITHIN THE PRIMARY CONTAINMENT AND OUT THROUGH THE OUTERMOST ISOLATION VALVES
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP A
   b) PROCESS & INST. PIPING BEYOND THE OUTERMOST ISOLATION VALVES
      SEISMIC CATEGORY I
      QUALITY CLASS I
      CODE GROUP B
   c) AIR INLET PIPING AND COMPONENTS
      SEISMIC CATEGORY I @
      QUALITY CLASS II
      CODE GROUP D
   @ SEE SECT. 15Q, CONTRACT 215
5. SLOPE ALL PIPING 1/8" PER FT. TOWARDS DRAIN SCALE.
6. EXHAUST TO SAFE AREA IN REACTOR BUILDING TO AVOID HAZARD TO PERSONNEL.
7. ALL INSTRUMENTATION ON THIS DWG. SHALL BE PREFIXED BY, MSLC.
8. EXCESS FLOW CHECK VALVE SHALL BE TAGGED AS FOLLOWS: PI-EFC-X (PENETRATION NO.)
9. CONTAINMENT INSTRUMENTATION ROOT VALVES SHALL BE TAGGED AS FOLLOWS: PI-V-X (PENETRATION NO.)

LEGEND

1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE.

REV. NO.	REVISION	DATE	DRWN	CHKD		
5	FOR REV 4 SEE RECORD MAC CARD PER TASK 8300: ADDED PED 215-M-4416 (A/C-7,8,9, D/E-8,9, H-6,6, J-5)	6-6-78	JP			
6	PER TASK 8500: PED 215-M-5115 (H-4,5 P-12)		KAD			
7	PER TASK 3040 PED 215-M-5226 (E-4, B-5, H-3-4)		PRW			
8	PER TASK 3040: PED 215-M-4586 (B-4, H-4)		PRW			
9	PER TASK 3040: PEDS 215-M-A109 (G+2, J-4, F-5) 220-I-548 (C-4)		PRW			
10	PER TASK 3040. PED 220-I-0662 (F 6-7-8, J-7-8)	/82	DRJ			

FSAR FIG. NO. 22-2E

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

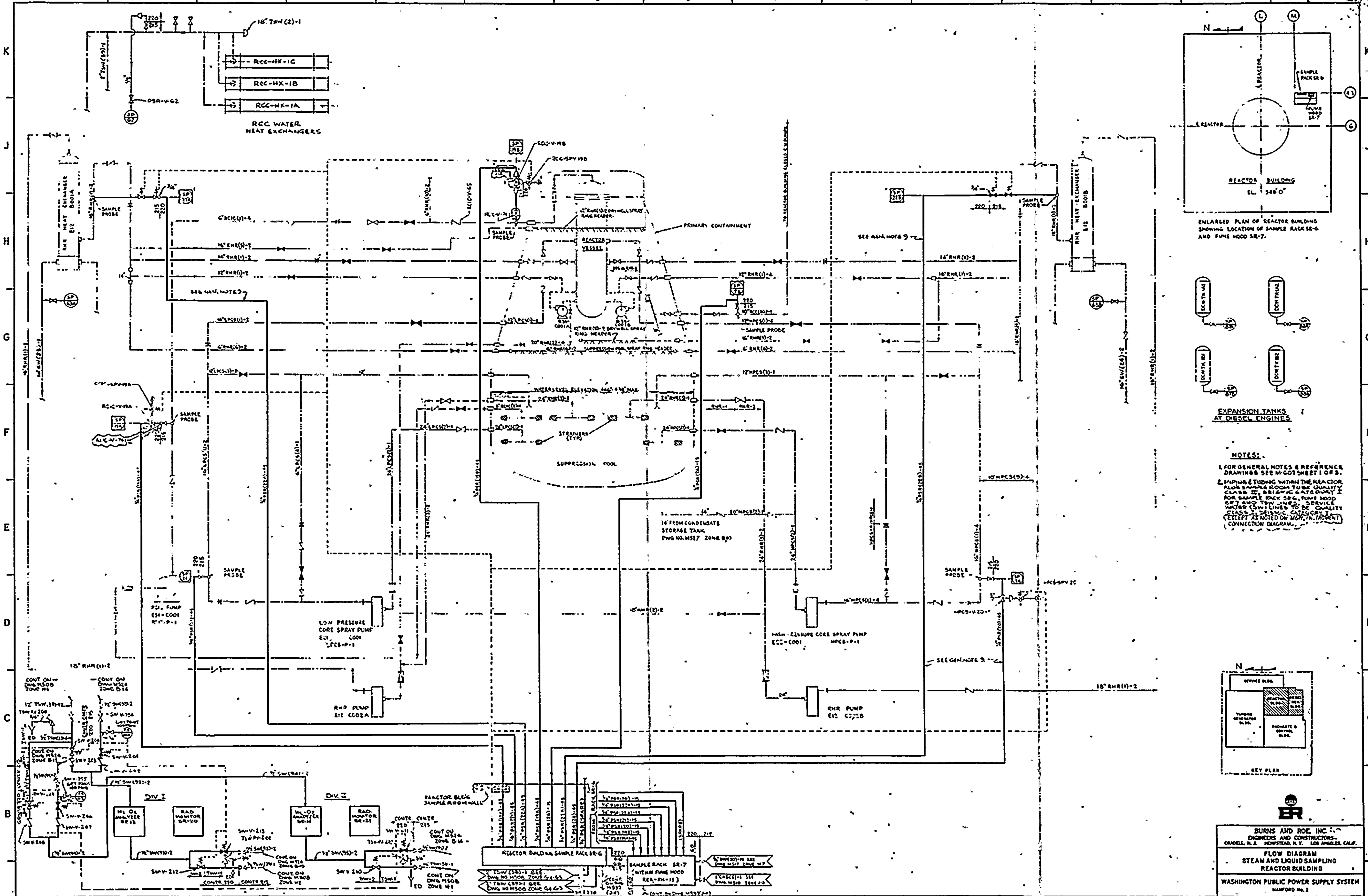
FLOW DIAGRAM
MAIN STEAM ISOLATION VALVE
LEAKAGE CONTROL SYSTEM-
REACTOR BUILDING

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE

W.O. 2808

DWG. M557 10



NOTES:

1. FOR GENERAL NOTES & REFERENCE DRAWINGS SEE M-607 SHEET 1 OF 3.
2. PIPING & TUBING WITHIN THE REACTOR PLUS SAMPLE ROOM TO BE QUALITY CLASS II, SEISMIC CATEGORY I FOR SAMPLE RACK SR-6, FUME HOOD SR-7 AND TSW LINES. SERVICE WATER (SW) LINES TO BE QUALITY CLASS I, SEISMIC CATEGORY I. EXCEPT AS NOTED ON MGF. INSTRUMENT CONNECTION DIAGRAM.

REV NO	REVISION	DATE	DRWN	CHKD	APPROVAL	APPROVAL
0	DRAWING APPROVED FOR CONSTRUCTION	[illegible]	ESC	PWL	[illegible]	[illegible]
1	CONTRACT 220: ADDED EXPANSION TANKS (ZONE G 2), REVISED VALVES & ADDED VALVE NOS. PSR-V-19A, 19B & 20 (ZONES F-14, J-10 & D-4) PER PCN 3559	[illegible]	N.D.	JRL	[illegible]	[illegible]
2	CONTRACT 220: ADDED COOLING WATER FOR ANALYZERS & RAD MONITORS (ZONES [illegible]) PER PCN [illegible]	-	-	-	-	-
2	DELETED [illegible] PER PCN 3586	[illegible]	J.F.	[illegible]	[illegible]	[illegible]
3	CONTR. 220: DELETED COOLING WATER SUPPLY & RETURN FROM RAD. MONITOR SR 20 & 21 (B12, B-14) PER PCN 4410	[illegible]	J.F.	PWL	[illegible]	[illegible]
4	CONTR 220: ADDED SPEC BREAKS AND DWG CONTINUATION NOTES ZONES A-8, A-A-9 PER PCN 4378	[illegible]	SN	PWL	[illegible]	[illegible]
5	PCN 6006 (PED 220-I-5007 [illegible])	[illegible]	PL	[illegible]	-	-
5	PER TASK 8300: ADDED PED-220-I-0007	[illegible]	MJP	[illegible]	[illegible]	[illegible]
6	PER TASK 8300: ADDED PED 220-I-0380 (J-10)	[illegible]	RAD	[illegible]	[illegible]	[illegible]
7	PER TASK 3040: PED-220I-584-(H-1-2) 215-M-A364-(F-14-15, H-V-10)	[illegible]	B.E.	[illegible]	[illegible]	[illegible]

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.

FLOW DIAGRAM
STEAM AND LIQUID SAMPLING
REACTOR BUILDING

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2

SCALE NONE
DATE 7-30-75

W.O. 2808

DWG. M607 SH.2 7

WPPSS Unit 2

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NUCLEAR PROJECT NO. 2

PUMP AND VALVE INSERVICE TEST

PROGRAM PLAN

50-397

Superseded per Rev 3 to Pump & Valve Inservice Test Program Plan.

cte JA 6/17/85

PUMP AND VALVE INSERVICE TEST
PROGRAM PLAN - REV. 2

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 2

Prepared by	Richard Wolfgramm Operations Support Engineering	11/3/83 Date
Reviewed by	Mark Reis Senior Mechanical Engineer	11/3/83 Date
Concurrence	Thomas D. Hoyle Supervisor, Code Programs	11/3/83 Date
Concurrence	Daniel W. Porter Manager, System Design Engineering	11/3/83 Date
Concurrence	[illegible] Manager, Plant QA/QC	11/3/83 Date
Approved by	[illegible] Plant Manager, WNP-2	11/3/83 Date
Concurrence	[illegible] Authorized Nuclear Inservice Inspector	11/3/83 Date

RECORD OF PROGRAM PLAN REVISIONS

No.	DATE	REVISIONS	BY	CHK'D	APP'D
2	11/3/83	REVISION	[illegible]	M. Reis	TF Hoyle
1	8/28/82	REVISION	MP Reis	[illegible]	TF Hoyle
0	4/23/81	ORIGINAL	MP Reis	F. Frisch	D.W. [illegible]

TITLE	SHEET	REVISION
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Sign Orig.	ii	2
Records of Revision	iii	2
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	3-2	2
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	3-5	1
	3-6	0
	3-7	2
	3-8	2
	3-9	0 (was 3.8)
	3-10	2
	3-11	1 (was 3.12a)

TITLE	SHEET	REVISION
3.0 Pump Test Program (Contd)	3-12	1 (was 3-12b)
	3-13	1 (was 3-10)
	3-14	2
	3-15	1 (was 3-14)
	3-16	2
	3-17	2
	3-18	2
	3-19	2
	3-20	2
	3-21	2
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	3-23	2
	3-24	2
	3-25	2
	3-26	1 (was 3-25)
	3-27	2
	3-28	2
4.0 WNP-2	4-1	2
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	4-5	2

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4.0 WNP-2 Valve Inservice Test Program (Contd)	4-6	2
	4-7	2
	4-8	2
	4-9	2
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	4-14	2
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	4-18	2
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	4-21	2
	4-22	2
	4-23	2
	4-24	2
	4-25	2

TITLE	SHEET	REVISION
4.0 WNP-2 Valve Inservice Test Program (Contd)	4-26	2
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	4-28	2
	4-29	2
	4-30	2
	4-31	2
	4-32	2
	4-33	2
	4-34	2
	4-35	2
	4-36	2
	4-37	2
	4-38	2
	4-39	2
	4-40	2
	4-41	2
	4-42	2
	4-43	2
	4-44	2
	4-45	0 (was 4-43)

TITLE	SHEET	REVISION	TITLE	SHEET	REVISION
4.0 WNP-2 Valve Inservice Test Program (Contd)	4-46	2			
	4-47	2			
	4-48	2			
	4-49	2			
	4-50	2			
	4-51	2			
	4-52	2			
	4-53	2			
	4-54	2			
	4-55	2			
	4-56	2			
	4-57	2			
	4-58	2			
	4-59	2			

TITLE	SHEET	REVISION
5.0 Quality Assurance Program	5-1	0
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Reactor Feedwater	M 529*	40
Reactor Recirc. Cooling	M 530*	36
Equip. Drain Radioactive	M 537*	41

*Burns & Roe Flow Diagram Number

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Containment Instru. Air	M 556*	26
Main Steam Leakage Cont.	M 557*	16
Steam and Liquid Sam.	M 607*sh. 2	12

1.0 INTRODUCTION

This Pump and Valve Inservice Test Program Plan is applicable to the WPPSS Nuclear Project No. 2, hereinafter referred to as WNP-2. A single unit Boiling Water Reactor (BWR), the power plant is located 11 miles north of Richland, Washington, on the Hanford Reservation. The plant employs a General Electric (GE) supplied nuclear steam supply system designated as BWR/5. The reactor is contained within an over-under drywell/wetwell containment vessel designated Mark II. The plant rated electrical output is 1,094 MWe.

This program plan is referenced in the WNP-2 FSAR, Section 3.9.6, and has been prepared as the controlling document governing Pump and Valve Inservice Testing at WNP-2. The requirements for Pump and Valve Inservice Testing are outlined in the ASME Boiler and Pressure Vessel Code, Section XI, entitled "Rules for Inservice Inspection of Nuclear Power Plant Components." The scope of this plan encompasses the testing of ASME Section III Nuclear Class 1, 2 and 3 pumps and valves, as defined by Subsections IWP and IWV of the ASME Code Section XI. This program plan complies with the requirements of the ASME Code 1980 Edition, with addenda through Winter, 1980 (and with addenda through Winter, 1981). This is consistent with FSAR commitments and with federal requirements for component testing as stated in Title 10, Code Federal Regulations, part 50 (10CFR50.55a(g)).

This Program Plan is comprised of two subprograms -- the Pump Inservice Test Program and the Valve Inservice Test Program. The detailed description of the scope, implementation, and administration of these two programs is detailed in subsequent sections (3.0 and 4.0).

2.0 TABLE OF CONTENTS

3.0 WNP-2 Pump Inservice Test Program

3.1 Introduction

Highly reliable safety related equipment is a vital consideration in the operation of a nuclear generating station. To help assure operability, the WNP-2 Pump Inservice Test Program has been developed. The Program is designed to detect and evaluate significant hydraulic or mechanical changes in the operating parameters of vital pumps and to initiate corrective action when necessary. The Program is based on the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWP. To the maximum extent practical the Program complies with the specifications of the approved Codes(1), Regulations (2), and Guidelines(3).

Consistent with the intent of Subsection IWP, the Supply System has incorporated into this program certain requirements which exceed the specifications of the Code. In particular, the Diesel Fuel Oil Transfer Pumps are included for testing due to their potentially significant impact on plant safety.

The Supply System recognizes that design differences among plants may render impractical certain Code requirements. For example, it is not always practical to require suction pressure measurement on vertical turbine ("deep well") type pumps. Where such impracticalities exist, they have been substantiated as exceptions as allowed by the Code. Alternate testing requirements have been proposed when warranted. The Relief Requests which document the exceptions comprise Section 3.6.

The Supply System is confident that the WNP-2 Pump Inservice Test Program complies with the intent of the approved Codes(1), Regulations(2), and Guidelines(3) and contributes to ensuring the safety of the general public.

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1. ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWP, (1980 Edition with Addenda through Winter, 1980 and 1981).

2. 10CFR 50:55 a(g).

3. NRC Staff Guidelines for complying with certain provisions of 10CFR 50:55 a(g) "Inservice Inspection Requirements".

3.2 Program Implementation

Surveillance testing is performed to detect equipment malfunction or degradation and to initiate corrective action. Since the safety related pumps are normally in a standby mode, periodic testing of this equipment is especially important. The WNP-2 Pump Inservice Test Program provides a schedule for testing safety related pumps and will be implemented as part of the normal surveillance routine.

Reference values will be determined in accordance with paragraph IWP-3110 of the ASME Code. It is anticipated that reference data will be gathered during initial surveillance tests. In most cases, test parameters will be measured with normal plant instrumentation. This approach will simplify the test program and will promote timely completion of surveillance testing. When permanently installed instrumentation is not available, portable instrumentation will be used to record the required parameters.

During subsequent surveillance tests, flow rate will normally be selected as the independent test parameter and will be set to match the reference flow rate. Then other hydraulic and mechanical performance parameters will be measured and evaluated against the appropriate reference values. The results of such evaluations will determine whether or not corrective action is warranted.

Each pump in the Pump Test Program will be tested according to a detailed test procedure. The procedure will include, as a minimum:

a) Statement of Test Purpose. This section will identify test objectives, reference applicable Technical Specifications and may note the operating modes for which the test is appropriate.

b) Prerequisites for Testing. System valve alignment, equipment for proper pump operation (cooling water, ventilation, etc.) and additional instrumentation (e.g., portable temperature or vibration monitors) will be noted. Identification numbers, range and calibration verification of additional instrumentation will be recorded.

c) Test Instructions. Directions will be sufficiently detailed to assure completeness and uniformity of testing. Instructions will include provisions for returning system to its normal standby configuration following testing. (For informational purposes, proposed flow paths are illustrated in Section 3.7.)

d) Acceptance Criteria. The ranges within which test data will be considered acceptable will be established by the Supply System and included in the test procedure. In the event that the data fall outside the acceptable ranges, operator action will be governed by approved Administrative Procedures.

Finally it is recognized that the Pump Inservice Test Program sets forth minimum testing requirements. Additional testing will be performed, as required, after pump maintenance or as determined necessary by the Plant Staff.

3.3 Program Administration

The operations staff of WNP-2 is responsible for the administration and execution of the Pump Inservice Test Program. The Program will be officially implemented upon the issuance of an Operating License and will govern pump testing for a 120 month period. Prior to that time, the Program will be reviewed and upgraded periodically to assure continued compliance with 10CFR 50:55a (g)(4). The Program may also be used as part of the pre-fuel loading surveillance testing program.

3.4 Pump Reference List

This list gives a brief description of each pump identified in the Pump Test Tables, Section 3.5.

HPCS-P-1

The High Pressure Core Spray pump provides emergency cooling spray to the reactor core. It is capable of injecting coolant at pressures equal to or above normal reactor operating pressures. The pump can take suction from the Condensate Storage Tank or from the Suppression Pool.

HPCS-P-2

This pump is dedicated to providing cooling water to the HPCS Emergency Diesel Generator, the standby power source for the High Pressure Core Spray System. HPCS-P-2 is located in the Pump House and takes suction from the spray pond.

LPCS-P-1

A high capacity, low head pump, the Low Pressure Core Spray pump provides cooling spray to the reactor core upon receipt of loss of coolant signal. LPCS-P-1 takes suction from the suppression pool except when testing to the Reactor Pressure Vessel.

RHR-P-2A, 2B, 2C

The Residual Heat Removal pumps are high capacity, low head pumps which have multiple uses during normal and emergency plant conditions. Briefly the system:

a) In conjunction with other systems, restores and maintains reactor coolant inventory in the event of a LOCA

b) Removes decay heat after shutdown

c) Cools the suppression pool

d) Can provide cooling spray to upper and lower drywell and to the wetwell

e) Can assist in fuel pool cooling

f) Can provide a condensing spray to the reactor head

g) Provides a flow path for Standby Service Water in case containment flooding is required.

Pumps take suction from the suppression pool in the standby operating mode.

SLC-P-1A, 1B

The Standby Liquid Control pumps are used to inject negative reactivity (sodium pentaborate) into the core independently of the control rod system. Suction is obtained from a storage tank containing the sodium pentaborate solution.

SW-P-1A, 1B

The Standby Service Water pumps supply cooling water to separate trains of safety related equipment. The pumps take suction on their respective spray ponds but eventually discharge to the opposite pond. The two ponds are the ultimate heat sink during loss of offsite power conditions.

RCIC-P-1

The turbine driven Reactor Core Isolation Cooling pump supplies coolant to the core in the event of reactor vessel isolation. It can take suction from either the Condensate Storage Tank or from the suppression pool.

DO-P-1A, 1B, 2

These pumps transfer diesel generator fuel oil from the subterranean storage tanks to the diesel's Day Tanks. Pump 2 is dedicated to the HPCS Diesel. The discharge lines of Pump 1A and 1B are cross tied, and each pump can supply fuel to either Diesel 1A or 1B.

FPC-P-1A, 1B

The Fuel Pool Circulation (FPC) pumps take suction on the spent fuel pool and discharge through the FPC heat exchangers and, during normal operation, through the Fuel Pool Filter/Demineralizers.

3.5 Pump Inservice Test Tables

The Test Table is the heart of the Pump Test Program. It presents a graphic display of the type and frequency of testing which the Supply System intends for its Class 1, 2 and 3 pumps. The Table incorporates the exceptions requested in Section 3.6 (Relief Requests).

Legend

Q = Quarterly (92 day interval) test
A = Annual test
N/A = Not applicable. See Relief Requests
NR = Not required
IWP - 4400 does not require pump speed measurement if pump is directly coupled to a constant speed motor driver.

Note A:

Storage Tank levels will be recorded and correlated to pressure in order to determine P_i and ΔP

Note B:

The Fuel Pool Cooling System is not expected to be in service until the first refueling outage at which time this testing program will be implemented.

WNP-2 Pump Inservice Test Table

IWP Parameter

Pump Ident.	ASME Code Class	Inlet Pressure, P_i	Discharge Pressure, P_o	Differential Pressure, ΔP	Flowrate, Q	Vibration, V	Bearing Temperature T_b	Pump Speed, N	Lubrication Level/ Pressure	Relief Request(s)
HPCS-P-1	2	Q	Q	Q	Q	Q	N/A	NR	Q	1
HPCS-P-2	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,3
LPCS-P-1	2	Q	Q	Q	Q	Q	N/A	NR	Q	1
RHR-P-2A	2	Q	Q	Q	Q	Q	N/A	NR	Q	1
RHR-P-2B	2	Q	Q	Q	Q	Q	N/A	NR	Q	1
RHR-P-2C	2	Q	Q	Q	Q	Q	N/A	NR	Q	1
SLC-P-1A	2	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,2
SLC-P-1B	2	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,2
SW-P-1A	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,3
SW-P-1B	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,3
RCIC-P-1	2	Q	Q	Q	Q	Q	N/A	Q	Q	1
DO-P-1A	3	Q See Note A	Q	Q	Q	Q	N/A	NR	Q	1
DO-P-1B	3	Q See Note A	Q	Q	Q	Q	N/A	NR	Q	1
DO-P-2	3	Q See Note A	Q	Q	Q	Q	N/A	NR	Q	1
FPC-P-1A See Note B	3	Q	Q	Q	Q	Q	N/A	NR	Q	1
FPC-P-1B See Note B	3	Q	Q	Q	Q	Q	N/A	NR	Q	1

3.6 Pump Test Program Relief Requests

Relief Requests identify Code requirements which are impractical for WNP-2 and provide technical justification for the requested exception. Where appropriate, they also propose alternate testing to be performed in lieu of the Code requirements.

RELIEF REQUEST RP-1

Pump(s)

HPCS-P-1,	RHR-P-2A,	SLC-P-1A,	DO-P-1A,	FPC-P-1A,
HPCS-P-2,	RHR-P-2B,	SLC-P-1B,	DO-P-1B,	FPC-P-1B,
LPCS-P-1,	RHR-P-2C,	SW-P-1A,	DO-P-2,	RCIC-P-1,
		SW-P-1B,		

Section XI Code Requirement
for which Relief is Requested

Measure bearing temperature and vibration. (IWP-3100)

Bases for Request

1. Except for FPC and RCIC pumps, these pumps are vertical turbine ("deep well") type pumps and are immersed in the fluid being pumped. This precludes measuring pump bearing vibration except for inboard bearings.

2. IWP-4300 only requires temperature measurement of "centrifugal pump bearings outside the main flow path". The outboard and intermediate bearings of all pumps are in the main flow path. Therefore, temperature measurement of these bearings is not required. The inboard bearings of the RHR pumps, LPCS-P-1 and HPCS-P-1, are cooled by the seal injection water which returns internally to the discharge flow. The inboard bearing on HPCS-P-2 (the head bearing), SW-P-1A and 1B, and DO-P-1/A, 1B, and 2 are cooled by the pumped fluid which returns to the discharge flow with no provision for temperature measurement.

3. Although the bearings for the FPC, SLC, and RCIC pumps are accessible, bearing housing temperature is not necessarily an accurate predictor of bearing condition. Hence, temperature measurement is an unnecessary requirement with unreliable results.

Alternate Testing Proposed

1. Except for FPC, SLC, and RCIC pumps, axial and radial vibration velocity measurement will be taken at the outboard bearing of the pump's motor. Radial vibration velocity measurements will be taken as close as practical to the inboard pump bearing.

2. Vibration velocity measurements will be taken on the inboard and outboard bearings of the FPC, SLC, and RCIC pumps.

3 Alert level will be $0.157 \leq V_b \leq 0.314$ in/sec. Required action level will be $V_b > 0.314$ in/sec. The General Machinery Vibration Severity Chart is provided for information purposes.

RP-1

Quality/Safety Impact

Measurement of vibration velocity provides more concise and consistent information with respect to pump and bearing condition. The usage of vibration velocity measurements can provide information as to a change in the balance of rotating parts, misalignment of bearings, worn bearings, changes in internal hydraulic forces and general pump integrity prior to the condition degrading to the point where the component is jeopardized. Bearing temperature does not always predict such problems. An increase in bearing temperature may not occur until the bearing has deteriorated to a point where additional pump damage may occur. Bearing temperatures are also affected by the temperatures of the medium being pumped, which could yield misleading results. Vibration readings are not affected by the temperature of the medium being pumped, thus the readings are more consistent. The proposed alternate testing will result in the maximum meaningful data regarding pump bearing condition. Since vibration velocity analysis is more predictive in nature than bearing temperature measurement, the alternate testing serves to increase levels of safety and quality.

RP-1

GENERAL MACHINERY VIBRATION SEVERITY CHART

For use as a GUIDE in judging vibration as a warning of impending trouble.

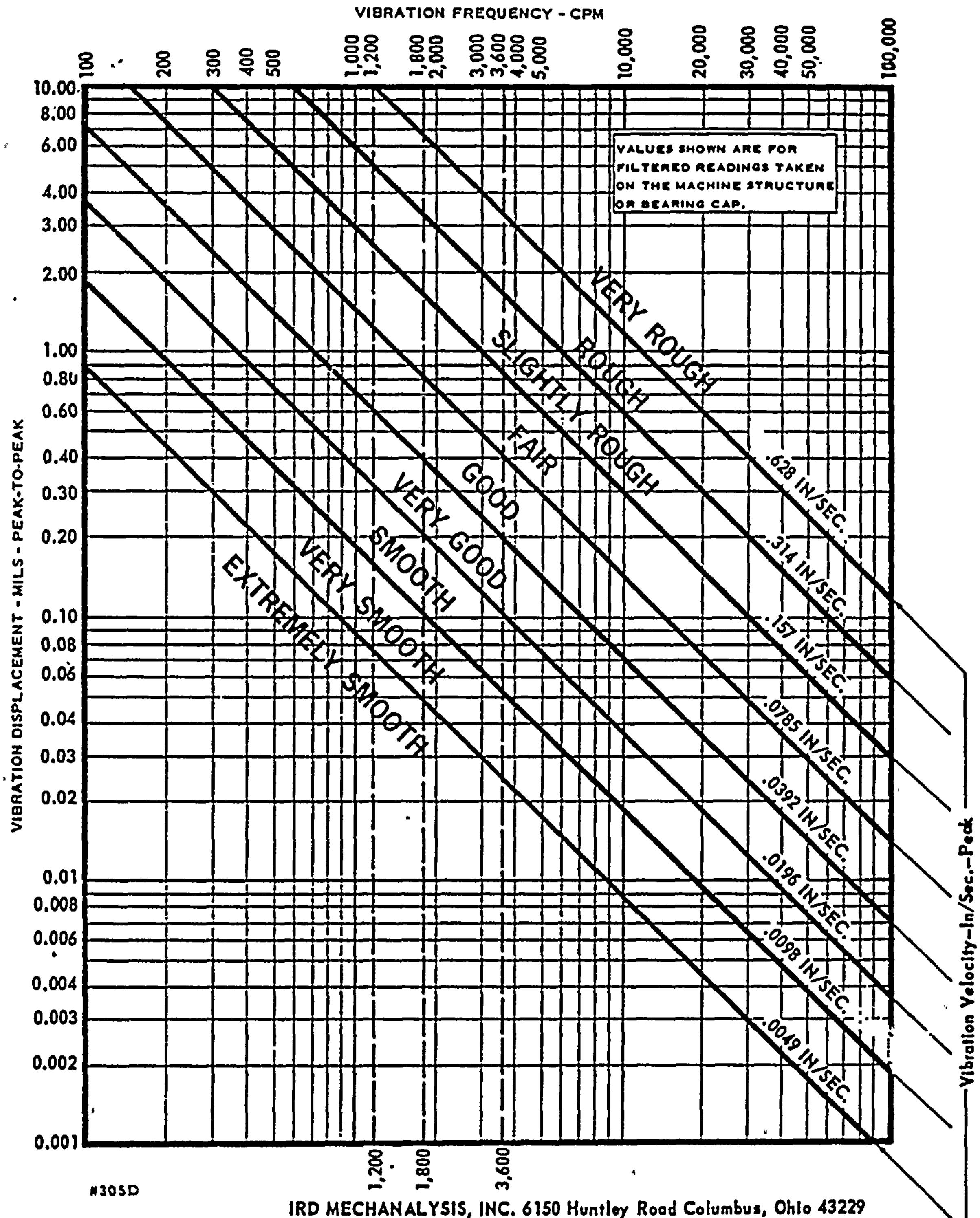


Figure 15. This chart can be used to cross-reference displacement with frequency to determine vibration severity.

RELIEF REQUEST RP-2

Pump(s)

SLC-P-1A
SLC-P-1B

Section XI Code Requirement
for which Relief is requested

Measure pump inlet pressure, P_i, and pump differential pressure, ΔP. (IWP-3100)

Bases for Request

1. The SLC pumps are positive displacement pumps which, at a constant speed, deliver essentially the same capacity at any pressure within the capability of the driver and the strength of the pump. The SLC pumps are directly coupled to constant speed·drive motors.

2. Surveillance requirements specify system alignments which assure adequate NPSH for the pumps.

3. There is no provision for suction pressure instrumentation.

4. Acceptable discharge pressure and flowrate will suffice as proof of adequate suction pressure.

Alternate Testing Proposed

Pump discharge pressure and flowrate will be measured and recorded during testing.

Quality/Safety Impact

Measurement of these parameters assures acceptable level of quality and safety since inadequate suction pressure would be indicated by erratic discharge pressure indication, subnormal flow rates and increased pump vibration and noise. These abnormal indications will be investigated and corrected as required by IWP-3200.

RELIEF REQUEST RP-3

Pump(s)

HPCS-P-2 SW-P-1A
SW-P-1B

Section XI Code Requirement
for which Relief is Requested

Measure pump inlet pressure, P_i, and differential pressure, ΔP. (IWP-3100)

Bases for Request

(1) SW-P-1A, 1B and HPCS-P-2 are vertical turbine type pumps which are immersed in their water source. They have no suction line which can be instrumented.

(2) Technical Specifications will state minimum allowable spray pond level to assure adequate NPSH and cooling water supplies.

(3) Difference between allowable maximum pond level and minimum level is only six (6) inches of water or 0.2 psi. This small difference will not be significant to the Test Program and suction pressure will be considered essentially constant.

(4) Acceptable flowrate and discharge pressure will suffice as proof of adequate suction pressure.

Alternate Testing Proposed

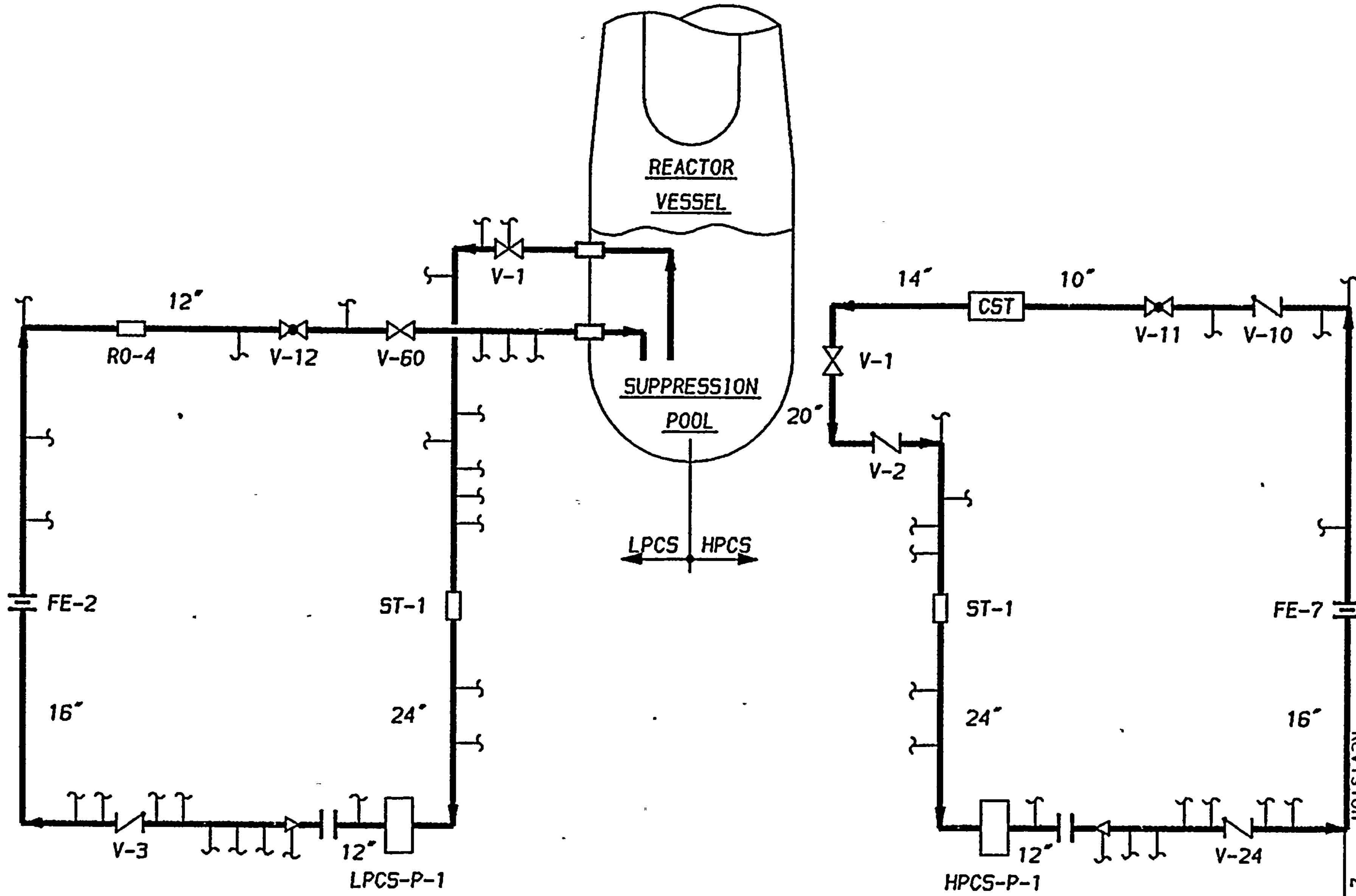
Spray pond level and pump discharge pressure will be recorded during the testing of these pumps.

Quality/Safety Impact

The effect of granting this request will be to introduce an error of 0.5 ft./500 ft. = 0.1% at rated discharge flow for SW-P-1A and 1B and an error of 0.5 ft/135 ft. = 0.37% for HPCS-P-2. These small errors will not significantly impact the quality of test results nor jeopardize the safety of the public.

3.7 Proposed Pump Test Flow Paths

These flow paths are proposed for use during pump testing and may be used during the valve test program. The valve alignment shown on these drawings reflect valve position during testing. Valve position during operations may be different. Surveillance procedures will define actual flow paths.



REFERENCES:

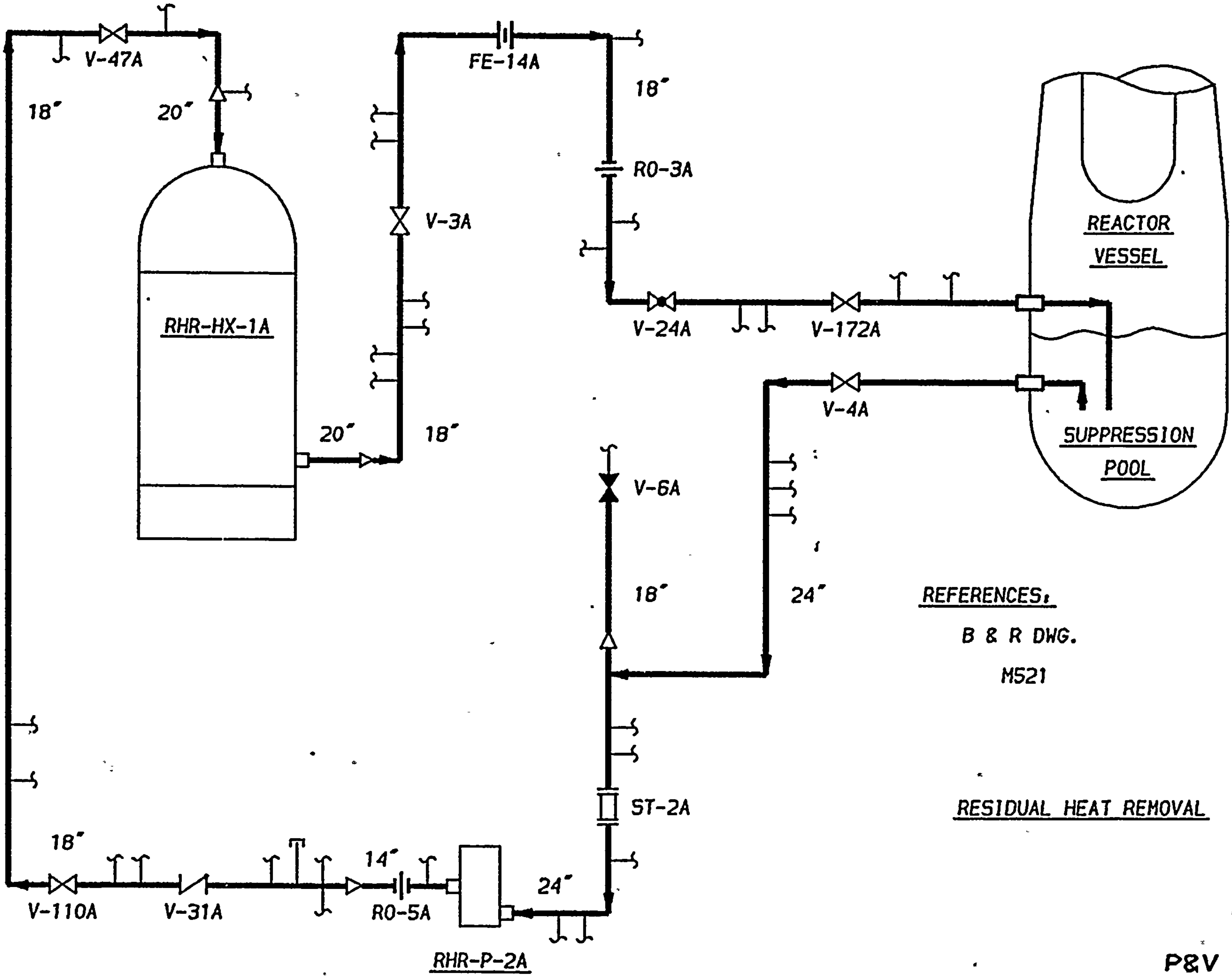
B & R DWG.

M520

HIGH PRESSURE CORE SPRAY

LOW PRESSURE CORE SPRAY

P&V A



REFERENCES:

B & R DWG.

M521

RESIDUAL HEAT REMOVAL

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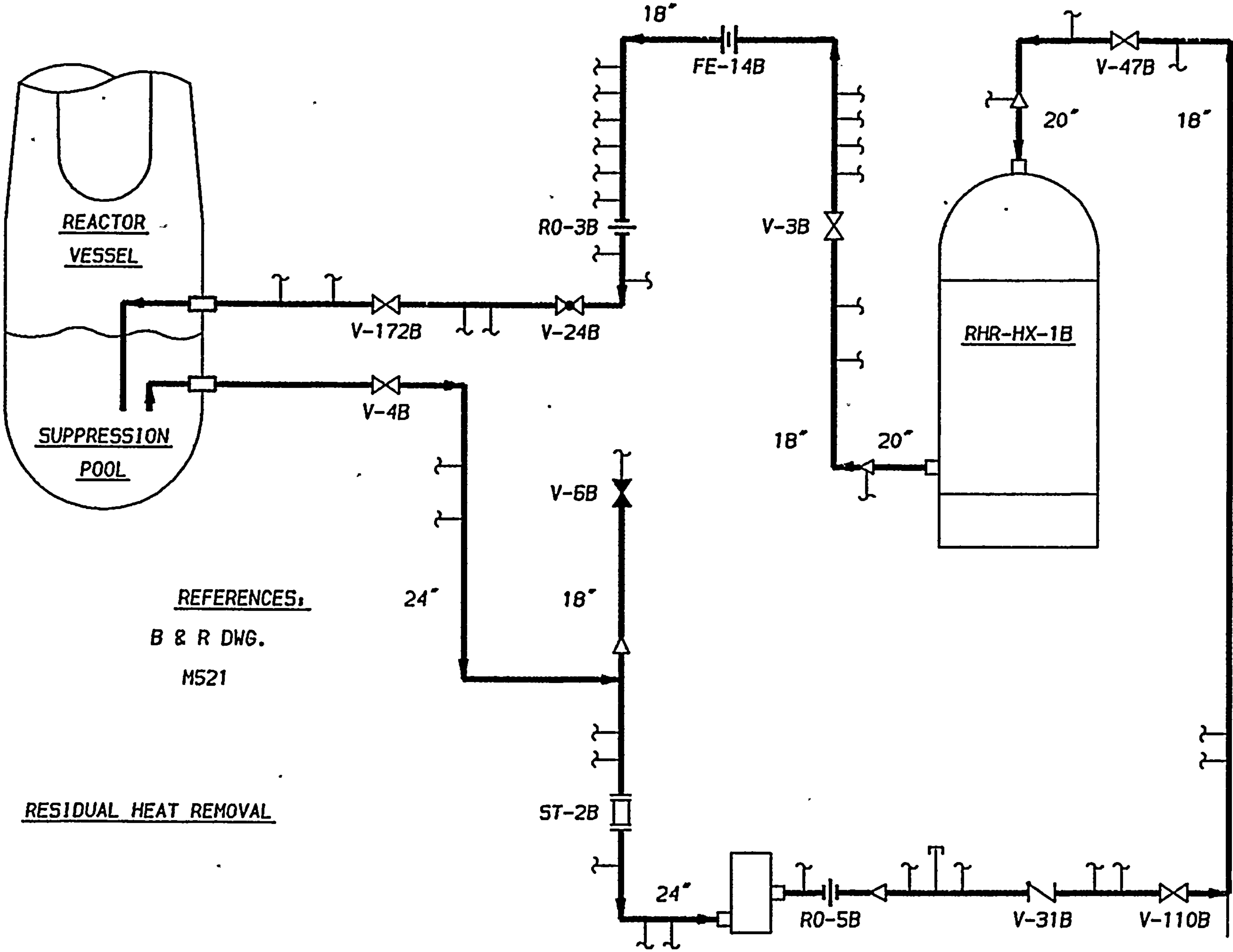
P&V B



REFERENCES:

B & R DWG.

M521

RESIDUAL HEAT REMOVAL

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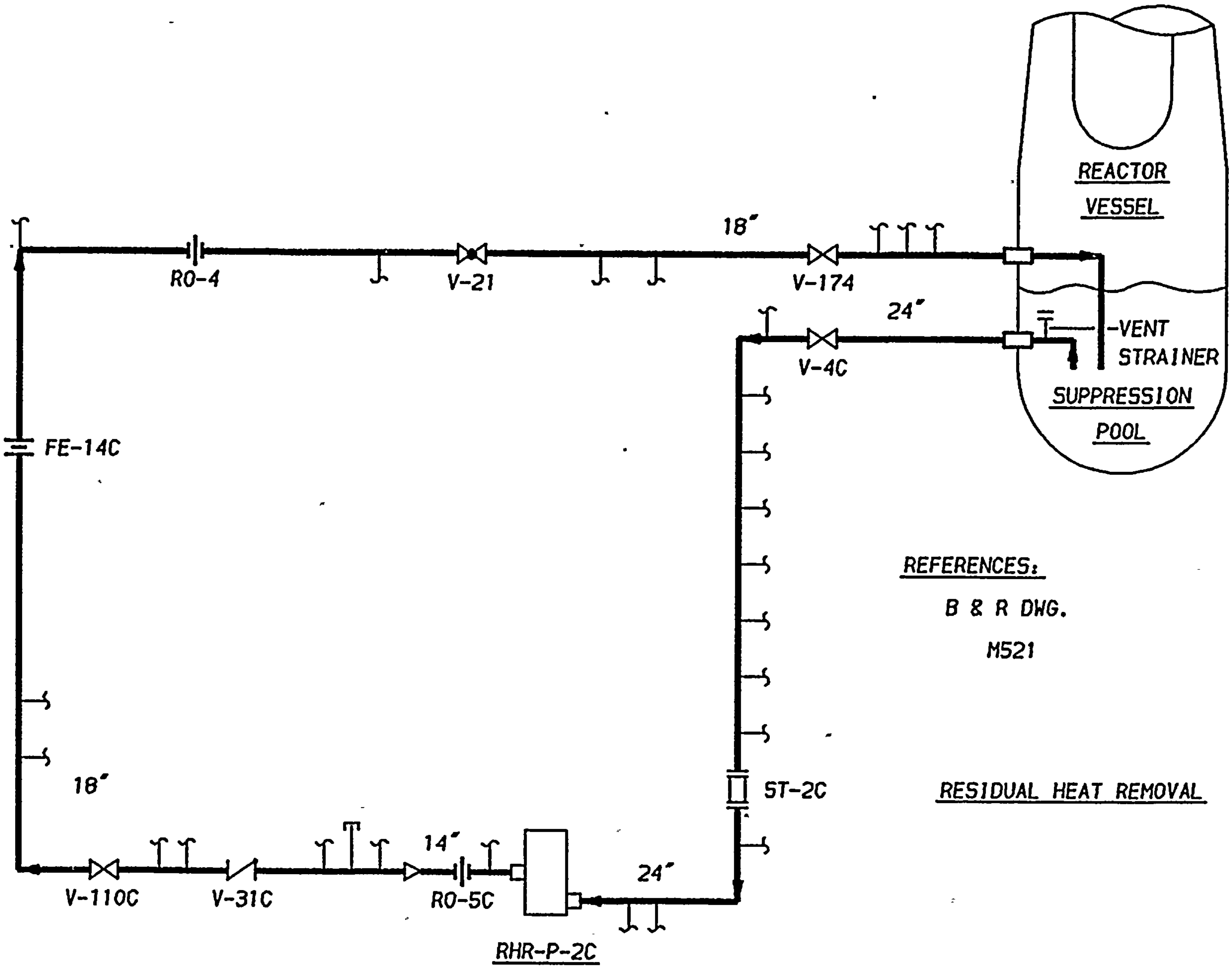

REFERENCES:

B & R DWG.

M521

RESIDUAL HEAT REMOVAL

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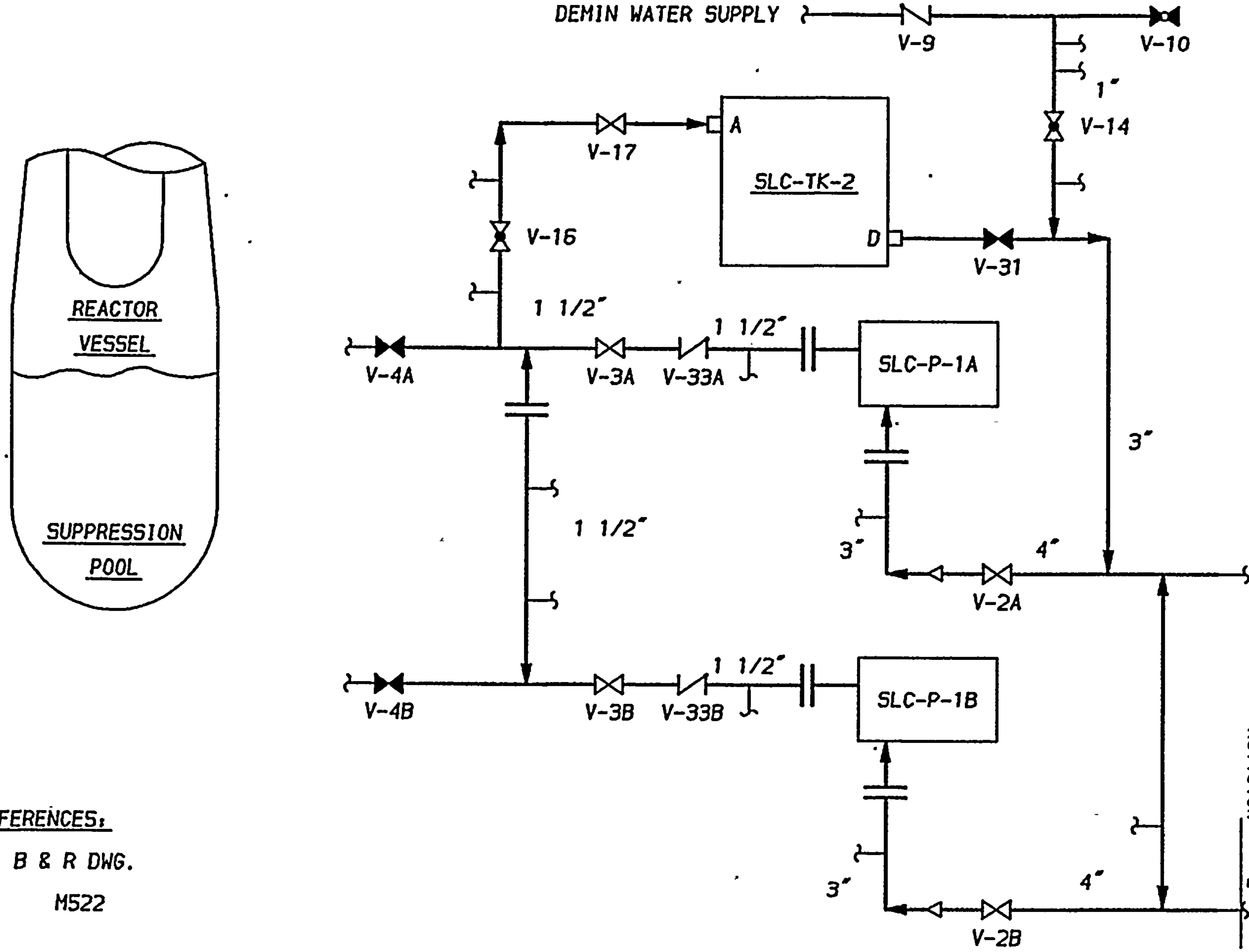
Revision 2

P&V D



REFERENCES:

B & R DWG.
M522

STANDBY LIQUID CONTROL

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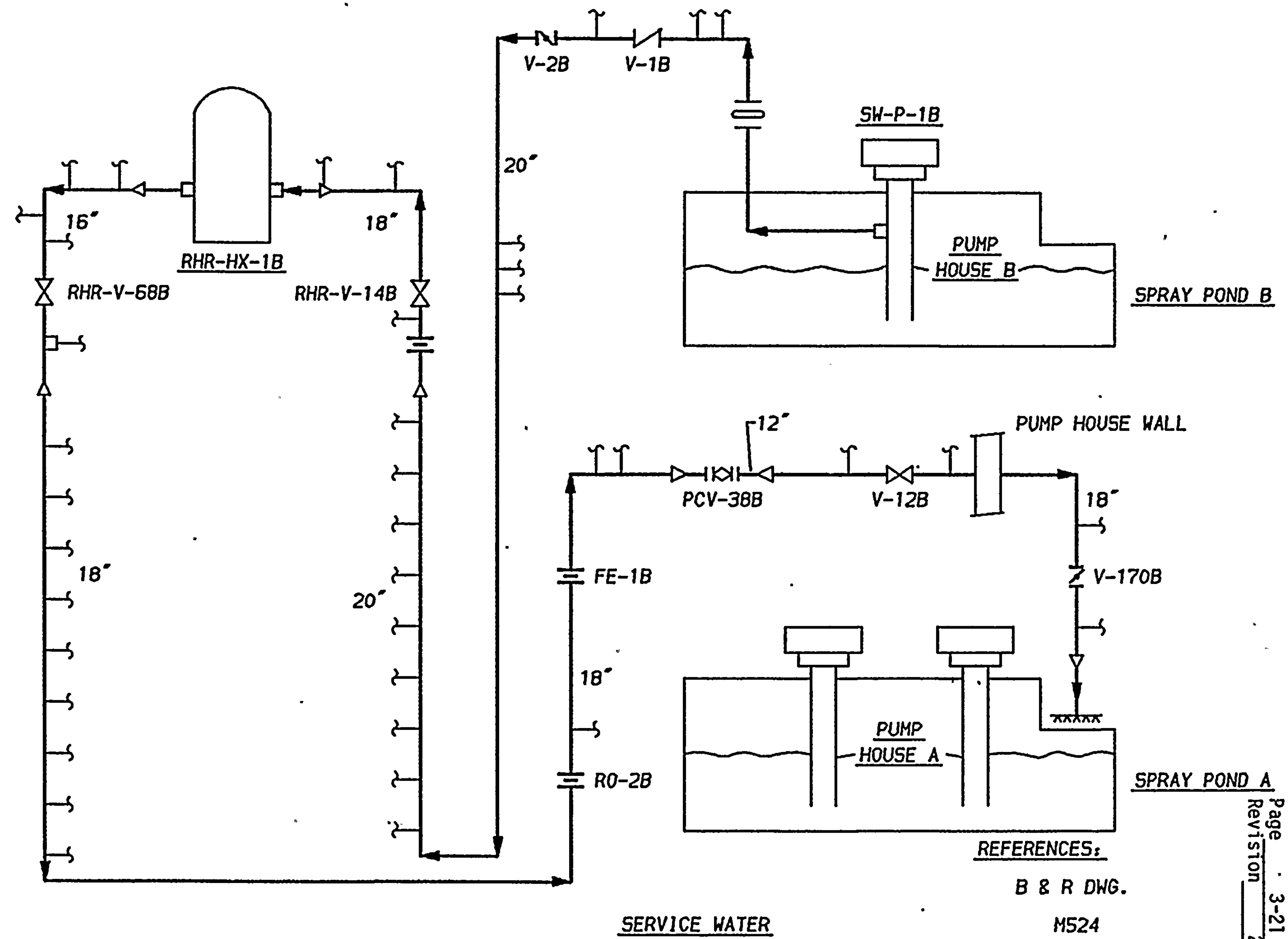
Revision 2

P&V E



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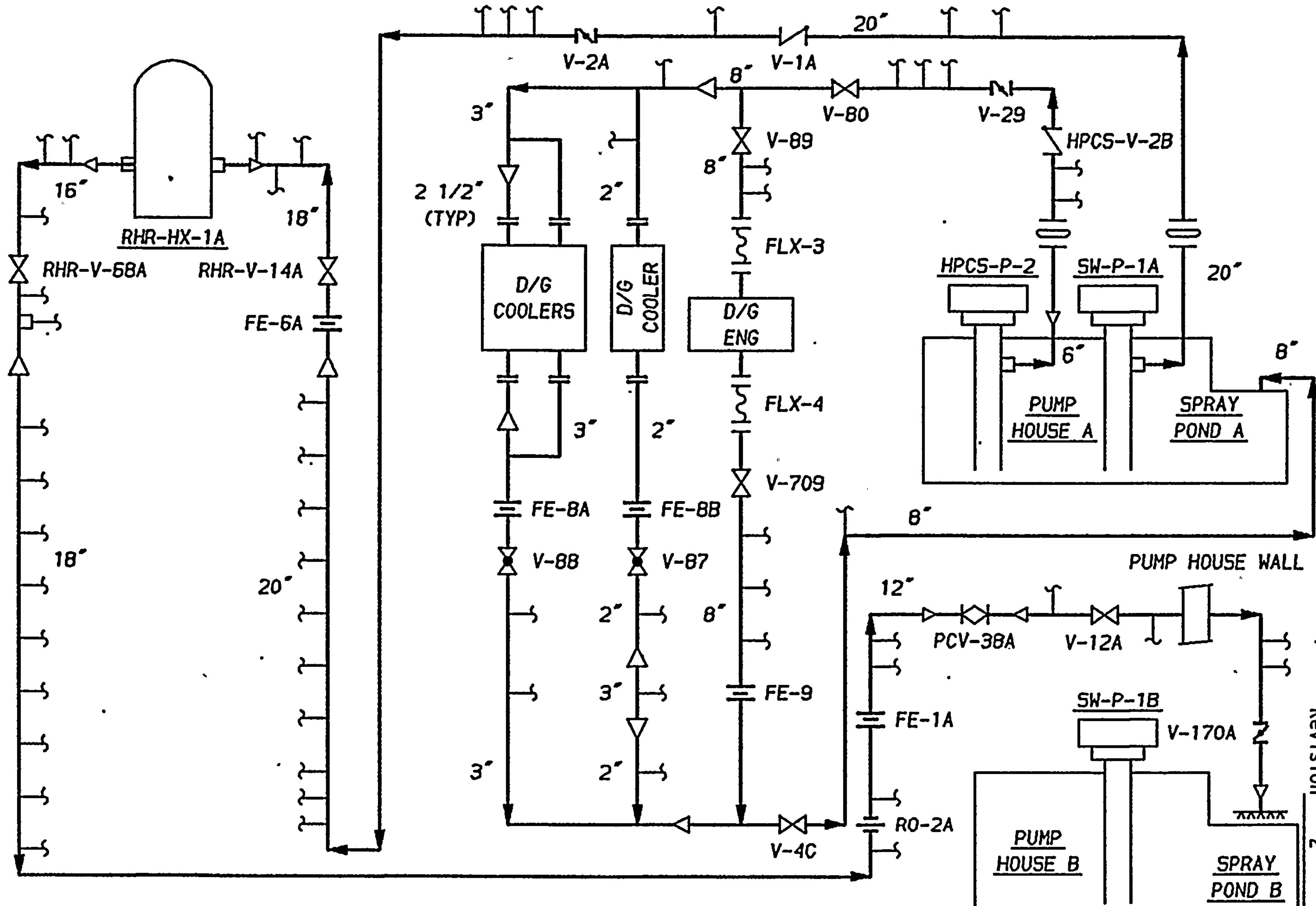
Revision 2

P&V F



REFERENCES:

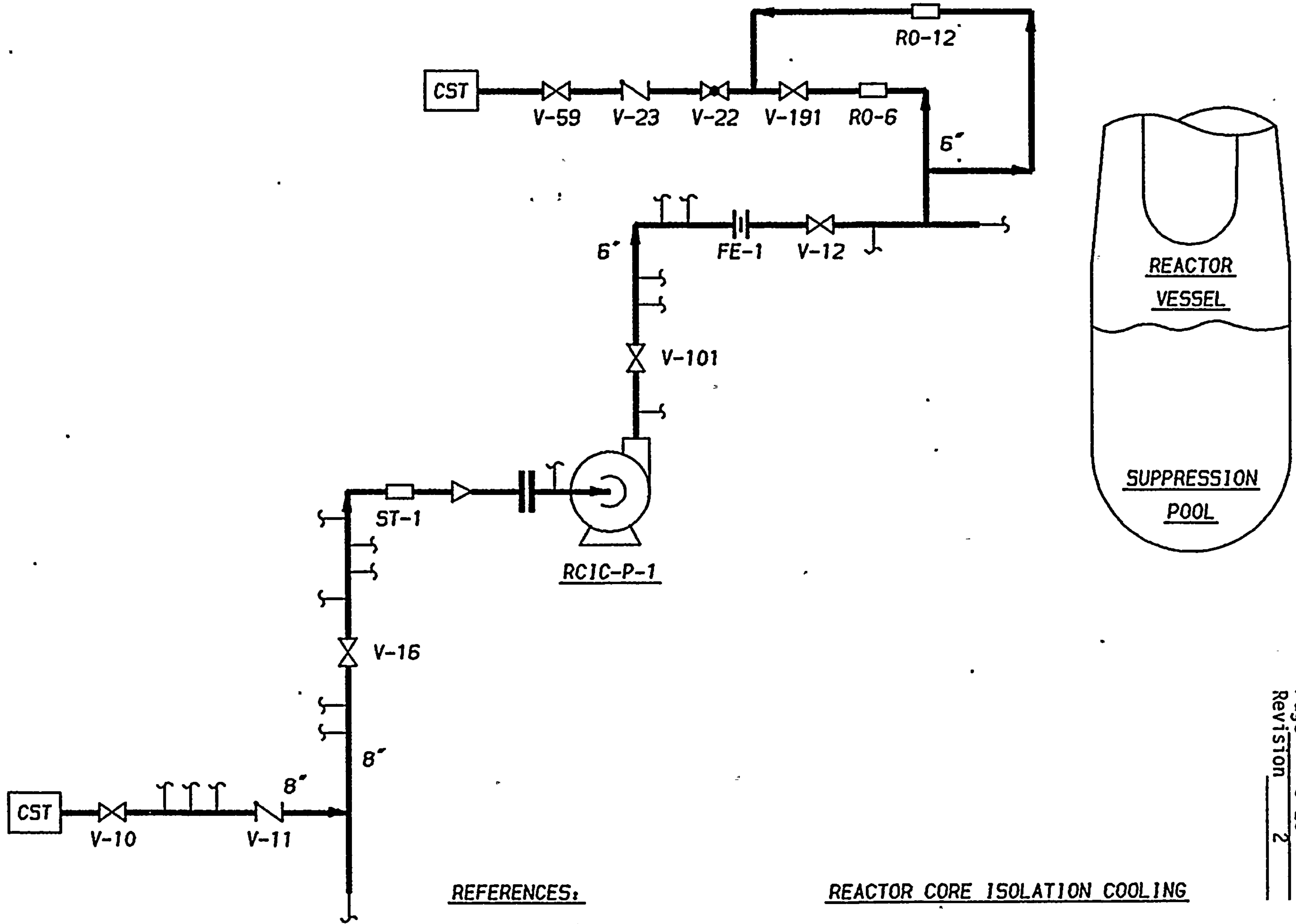
B & R DWG

M524

SERVICE WATER

P&V G

Page 3-22
Revision 2



REFERENCES:

B & R DWG

M519

REACTOR CORE ISOLATION COOLING

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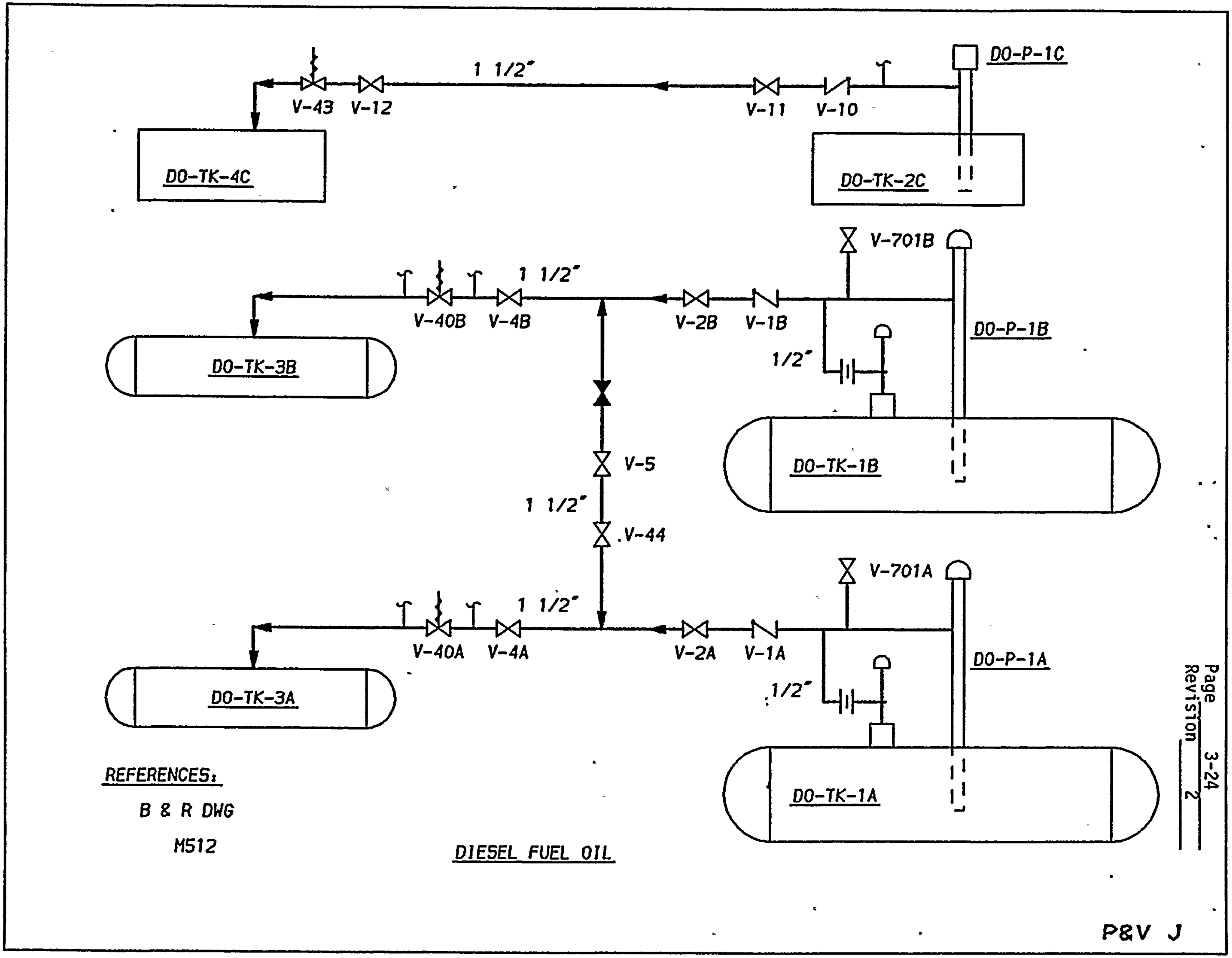
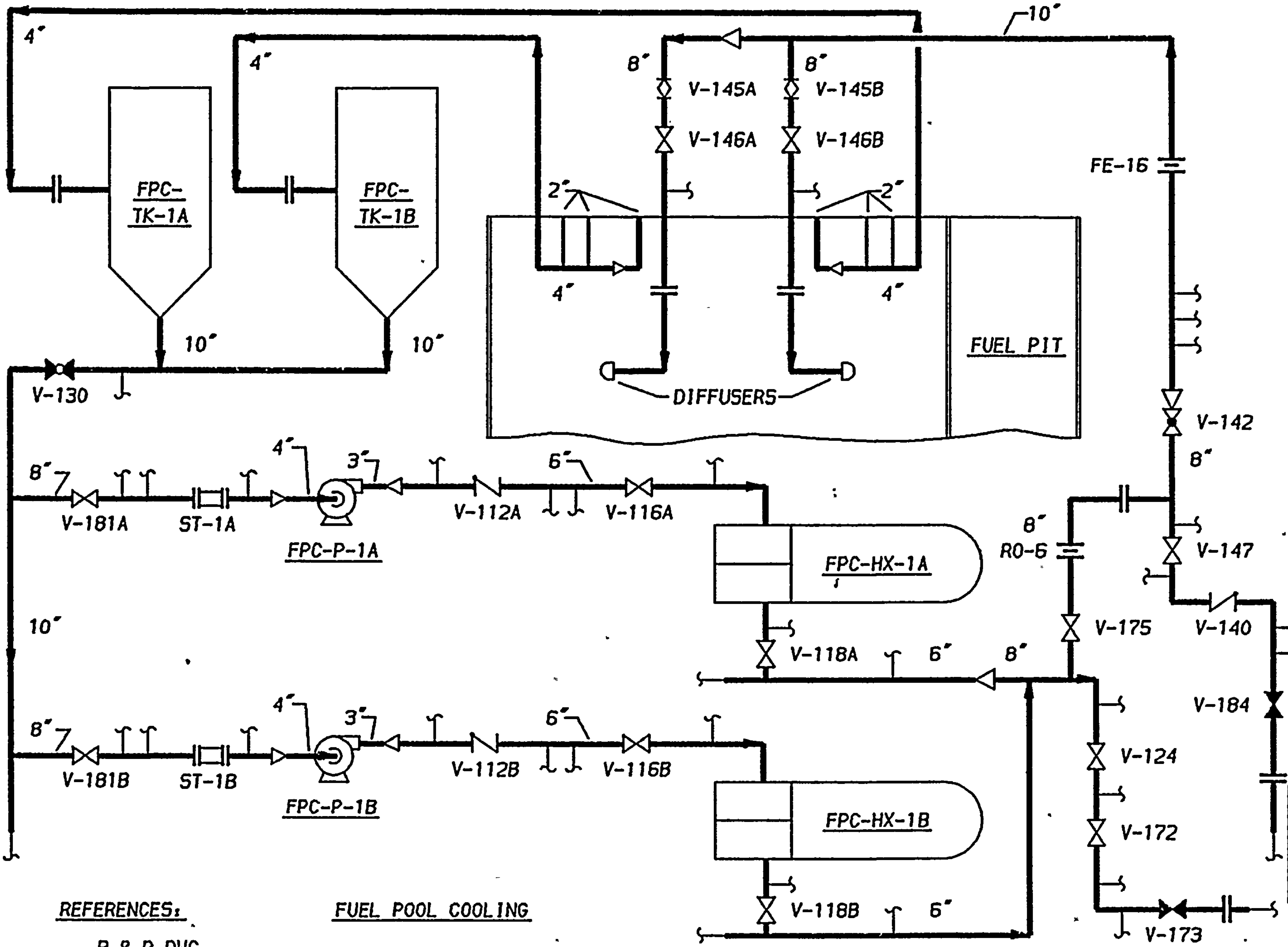
Revision 2


DO-P-1C
1 1/2"
V-43
V-12
V-11
V-10
DO-TK-4C
DO-TK-2C
V-701B
1 1/2"
V-40B
V-4B
V-2B
V-1B
DO-P-1B
1/2"
DO-TK-3B
DO-TK-1B
V-5
1 1/2"
V-44
V-701A
1 1/2"
V-40A
V-4A
V-2A
V-1A
DO-P-1A
1/2"
DO-TK-3A
DO-TK-1A
REFERENCES:
B & R DWG
M512
DIESEL FUEL OIL
P&V J



REFERENCES:

B & R DWG.

M526

FUEL POOL COOLING

P&V K

3.8 Records of Inservice Tests

Records of Pump Inservice Test results will be maintained in accordance with Article IWP-6000 of the Code. A file will be established for each pump and will include:

1) Pump identification by equipment piece number, manufacturer, and serial number.

2) Inservice test plans. This may be by reference to the surveillance test procedure by which the pump is tested.

3) Summaries of corrective action.

The Pump Inservice Test Program, associated surveillance test procedures and results will be kept at the WNP-2 plant site. For informational purposes, a sample pump test data sheet is provided.

SAMPLE

DATA SHEET

PUMP OPERABILITY

HYDRAULIC DATA

EPN LPCS-P-1

Item	Inst. No.	Calib. Void Date	Measured Value	Init.
Suct. Press (Before Start) PSIG	LPCS-PI-1			
Suct. Press (At Test Flow) PSIG	LPCS-PI-1			
Disch. Press (At Test Flow) PSIG	LPCS-PI-2			
Diff. Press, PSI	N/A	N/A		
Flow, gpm	LPCS-FI-600			
Fluid Temp., °F	SPTM-TR-3			

MECHANICAL DATA

Item	Inst. No.	Calib. Void Date	Measured Value	Init.
Pmp. Brg. Temp., °F (Inbd.)	N/A	N/A	N/A	
(Obd.)	N/A	N/A	N/A	
Dvr. Brg. Temp., °F (Inbd.)	W130	N/A		
(Obd.)	W128/W129	N/A		

Pmp. Lubrication: Sat. ________ Unsat. ________ Pump Speed ________ RPM ________
Dvr. Lubrication: Sat. ________ Unsat. ________ Inst. No. ________ Cal Void ______

ELECTRICAL DATA

Bus Voltage: Inst. No. ________ Calib. Void Date ________ VAC ________
Motor Current: Inst. No. LPCS-AM-1 Calib. Void Date ________ Amp ________
Completed by ____________________ Date/Time ____________

ACCEPTANCE CRITERIA

Parameter	Refer. Value	Meas. Value	Alert Range Lo	Alert Range Hi	Action Range Lo	Action Range Hi	Shift Mgr. Init./Date
Flow(1)							
Delta P(1)							
Suct. Press(1)							
Bearing Temp.							

Reviewed by: ____________________ Date/Time ____________

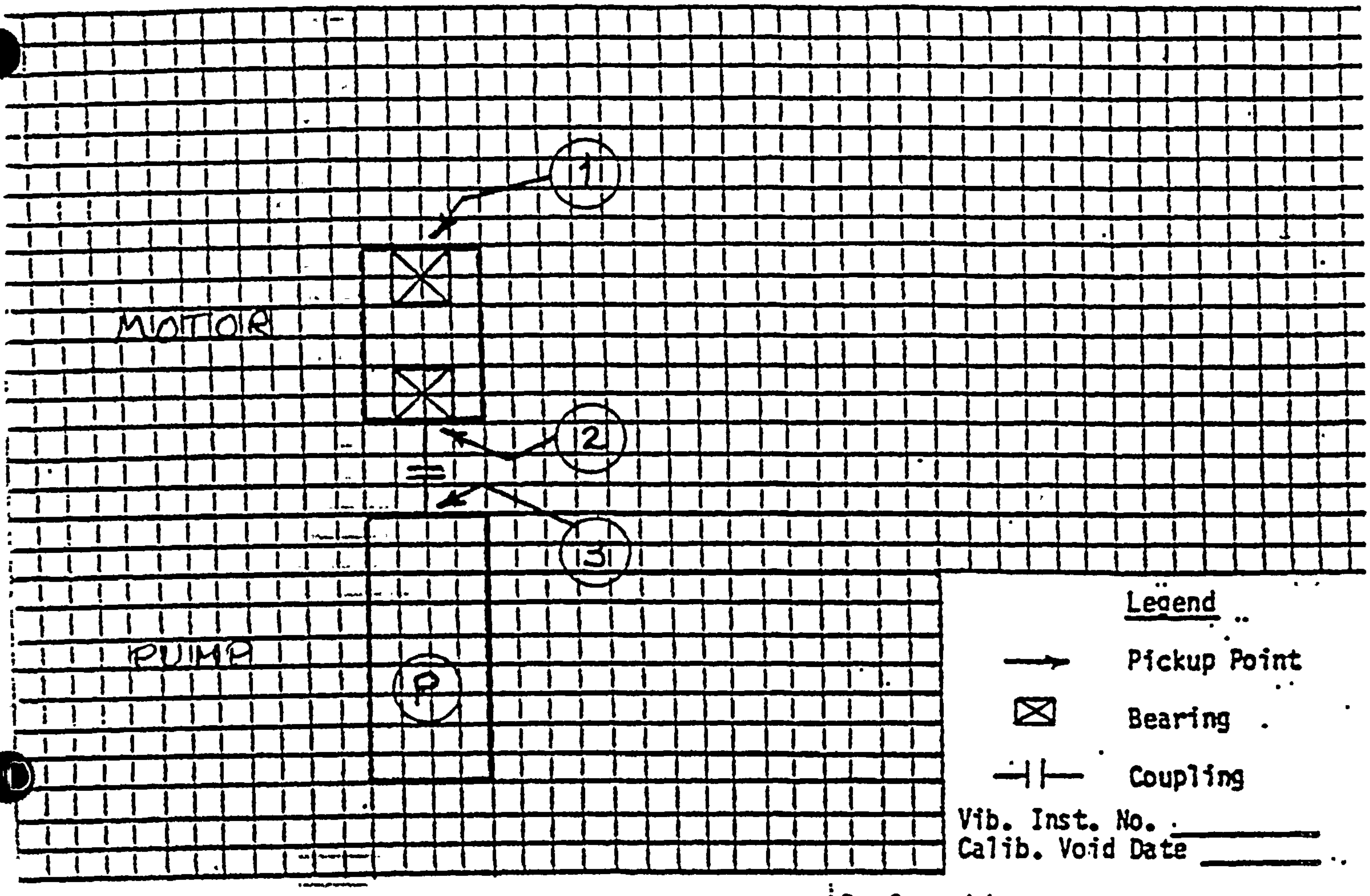
(1) If deviations fall within the ALERT RANGE, the test frequency is increased to once each 45 days; if within the ACTION RANGE, the pump shall be declared inoperable and the deviation investigated and/or corrected.

SAMPLE

VIBRATION DATA

DATA SHEET
PUMP OPERABILITY

EPN LPCS-P-1



Vib. Inst. No. ________
Calib. Void Date ________

Performed by: ________
Date/Time: ________

Point	Pos.	Filter Out Velocity, V_h In/Sec	CPM
1	# NS		NA
	# EW		
	V		
2	# NS		
	# EW		
	A	NA	
3	# NS		
	# EW		
	A		
	H		
	V		
	A		
	H		
	V		
	A		

Acceptance Criteria

Alert Range

0.157 in/sec $\leq$ Vb < 0.314 in/sec

Action Range

Vb $\geq$ 0.314 in/sec

Shift Manager/Date/Time

Engineer/Date/Time

4.0 WNP-2 Valve Inservice Test Program

4.1 Introduction

Washington Public Power Supply System Nuclear Project Unit 2 (WNP-2) is a Boiling Water Reactor constructed in compliance with the ASME Boiler and Pressure Vessel Code. Section XI of the Code requires periodic testing of certain safety related valves in order to verify their operability and leak tight integrity. The WNP-2 Valve Inservice Test Program satisfies these requirements and conforms to FSAR commitments and Technical Specifications for ASME valve testing.

The Program will detect potentially adverse changes in the mechanical condition of valves within the scope of Section XI, Subsection IWV of the Code. The scope includes all valves "which are required to perform a specific function in shutting down a reactor to the cold shutdown condition <u>or</u> in mitigating the consequences of an accident". Many valves used in normal shutdown operations are not necessarily "required" nor would they necessarily be available for that purpose. Hence, the scope of IWV is restricted to valves required to shutdown the reactor in emergency situations and to mitigate accident consequences.

The Code recognized that certain of its requirements may be impractical for a specific plant and contains provisions for requesting relief from impractical requirements. The relief requests for the Valve Inservice Test Program (Section 4.5) identify testing impracticalities, provide technical basis for the request and propose alternate testing where warranted.

The Supply System is confident that the WNP-2 Valve Inservice Test Program complies with the intent of all applicable Codes, Regulations(1), and Guidelines(2) and contributes to ensuring the safety of the general public.

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(1) 10CFR 50:55 a(g)(2)

(2) NRC Staff guidelines for excluding exercising (cycling) tests of certain valves during Plant operations.

4.2 Program Implementation

The Valve Inservice Test Program will be executed as part of the normal plant surveillance routine. Two types of tests will be conducted as part of this Program:

1) Valve Operability Tests
2) Valve Leak Rate Tests

Valve Operability Tests are only applicable to active valves of categories A, B, C, and D. These valves are listed in the Valve Test Tables provided in Section 4.4 of this Program.

The Valve Operability Tests based on the requirements specified in Section XI, Subsection IWV of the Code will verify 1) the valve responds to control commands including its failsafe response if applicable, 2) the valve stroke time is within specific limits and, 3) remote position indication accurately reflects the observed valve position. Baseline data for stroke times will be obtained from initial Valve Operability Tests. The initial Valve Operability Tests will meet the requirements for preservice testing (IWV-3100). The limiting values of test results such as stroke times and leakage rates are stated in the test procedures.

Fail safe valves as identified by the valve test tables will be tested by observing the valve operation upon loss of electrical, pneumatic or hydraulic actuating power. In most cases, loss of electrical power causes loss of actuating fluid and can be accomplished using normal control circuits.

Subsubarticle IWV-3420 of the Code specifies that valve leak rate tests are required for category A valves. At WNP-2 there are three divisions of category A valves:

Division I -- Those valves listed in the WNP-2 FSAR, Table 6.2-16, as being containment isolating valves. These valves will be leak tested using the requirements of 10CFR50, Appendix J. The Appendix J requirements specifically address test and acceptance criteria for valves functioning as containment isolation valves.

Division II -- Those valves not listed in the FSAR, but listed in the Valve Test Tables, Section 4.4. These valves will be leak tested using the requirements of IWV-3420.

Division III -- Those valves listed not only in the FSAR, but also listed in the WNP-2 Technical Specification as being reactor coolant system pressure isolation valves. These valves shall be leak tested using the requirements of both 10CFR50, Appendix J and IWV-3420.

The category A valves identified in this program and their associated leak testing requirements are implemented using a unified leak testing program which will maximize compliance with the various requirements and commitments, provide consistency in test methodology and reduce duplication of effort.

Valves in the Valve Test Program will be tested according to detailed procedures. The procedure will include, as a minumum:

a) Statement of Test Purpose. This section will identify test objectives, reference applicable Technical Specifications and note the operating modes for which the test is appropriate.

b) Prerequisites for Testing. System valve alignment and additional instrumentation (e.g., stop watch) will be noted. Identification numbers, range and calibration verification of additional instrumentation will be recorded.

c) Test Instructions. Directions will be sufficiently detailed to assure completeness and uniformity of testing. Instructions will include provisions for returning the system to its normal standby configuration following testing.

d) Acceptance Criteria. The ranges within which test data will be considered acceptable will be established by the Supply System and included in the test procedure. In the event that the data fall outside the acceptable ranges, operator action will be governed by approved Administrative Procedures.

Finally it is recognized that the Valve Inservice Test Program sets forth minimum testing requirements. Additional testing will be performed, as required, after valve maintenance or as determined necessary by the Plant Staff.

4.3 Program Administration

The Valve Inservice Test Program will be administered in a manner analogous to the Pump Inservice Test Program.

4.4 Valve Test Tables

The Valve Test Tables are the essence of the Supply System's Program to meet ASME Section XI, Subsection IWV requirements. The Tables only include active valves which are required to operate in order to safely shutdown the reactor or mitigate the consequences of an accident. Passive Category A valves required to be leak tested are listed in the FSAR as described in Section 4.2. The Tables reflect the positions taken in support of the relief requests.

Unless noted otherwise the following requirements apply to valves listed in the Valve Test Tables:

a. All valves with remote position indicators shall be tested in accordance with IWV-3300.

b. All valves with fail safe actuators shall be tested in accordance with IWV-3415 at the frequency noted in the Tables.

c. As described in Section 4.2 of this program, all valves identified as category A will be leak tested in accordance with IWV-3420 requirements or 10CFR50, Appendix J requirements or both.

To Aid the in the interpretation of the Tables, brief explanations of the Table headings and abbreviations are provided.

(1) Valve Number — Each piece of equipment in the plant has a unique "tag" number which identifies the system to which the equipment belongs, the type of equipment (flow control valve = FCV, relief valve = RV, rupture disc = RD, etc.), and a unique serial number.

(2) Class — ASME Code Class per Section III of the ASME Boiler and Pressure Vessel Code. These are roughly equivalent to the safety classes defined in Chapter 3 of the FSAR.

(3) Coordinates — The specific coordinates of each valve are supplied to facilitate location of the valves on the flow diagram provided.

(4) Valve Category — Categories are defined by ASME Section XI, subsection IWV. Each valve has specific testing requirements which are determined by the category to which it belongs. The letter "F" in the column for category "A" identifies those valves listed in WNP-2 FSAR, Table 6.2-16 and will be leak tested using 10CFR50, Appendix J requirements. The letter "T" in the column for category "A" identifies those valves listed not only in the FSAR, but also in WNP-2 Technical Specifications and will also be leak tested using the requirements of IWV.

NOTE: The designation of Category A valves with a "T" or "F" is intended to be an informational courtesy. A change to the referenced portion of the Technical Specification and FSAR may not necessitate a revision to this Program.

(5) Size — Nominal pipe diameter to which the valve connects is given in inches.

(6) Valve Type — The following abbreviations are used to describe valve type:

BF = Butterfly valve	GT = Gate Valve
CK = Check valve	RD = Rupture disc.
DIA = Diaphragm valve	RV = Relief Valve
GB = Globe valve	S/R = Safety/Relief Valve
SC = Stopcheck valve	SV = Solenoid Valve

(7) Actuator Type — The following abbreviations are used to describe actuator types. Valves may be actuated in more than one way.

AO = Air operated

HO = Hydraulic operated

MAN = Manually operated

MO = Motor operated

SA = Self actuated (actuated by a change in system parameters such as flow or pressure, e.g., check and relief valves).

SOL = Solenoid operated

(8) Normal/Failed Position — This column identifies the valve's normal position and failed position. This is used to identify valves with fail safe actuators for testing per IWV-3415:

NO = Normally Open	NC = Normally Closed
FO = Failed Open	NA = Not Applicable
FC = Failed Close	FAI = Fail As Is

(9) Test During

This column defines the operating modes as defined by the Technical Specifications, during which the valve may be safely tested. See below for the definition of "all," "CSD" and "Refuel."

Legend	Meaning
All	Testing is approved during all operating modes and will be conducted on a quarterly basis, as permitted by plant status.
CSD	Cold shutdown. Guidance for Inservice valve testing at cold shutdown is: Valve testing should commence within 24 hours after cold shutdown is achieved and continue until complete or until plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one cold shutdown should be performed during the subsequent cold shutdowns to meet the Code specified testing frequency.
Refuel	Test will be conducted during refueling outages but at least every two years. Certain work which is nominally scheduled for a refueling outage may be performed at other times when plant conditions permit. The two year minimum frequency will be maintained.

IWV-3620	Test frequency will be according to vendor specifications.
(10) <u>Test</u>	Testing requirements identified for the valve are identified here.
S/E	Stroke exercise; valve timing not relevant.
S/T	Stroke time; valve must meet stroke timing requirements specified in the test procedure.
Bench Test	Relief valves will be tested in accordance with IWV-3500 requirements.
IWV-3620	Rupture disc will be tested in accordance with Section XI, Subsection IWV, paragraph 3620.
(12) <u>Notes</u>	This column is used to provide reference to explanatory notes located at the end of the Valve Test Tables.
(13) <u>Requests for Relief</u>	This column is used to cross reference documentation which requests waiver of certain code requirements. A valve may have more than one associated relief request.

System Name DIESEL OIL AND MISC. (DO) Dwg. No. M 512

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
DO-V-1A	3	D3		X	X		1 1/2	CK	SA	NC/NA	ALL	S/E		
DO-V-1B	3	D3		X	X		1 1/2	CK	SA	NC/NA	ALL	S/E		
DO-V-10	3	H5		X	X		1 1/2	CK	SA	NC/NA	ALL	S/E		
DO-V-40A	3	E3		X			1 1/2	SV	SOL	NC/FC	ALL	S/E		1
DO-V-40B	3	E3		X			1 1/2	SV	SOL	NC/FC	ALL	S/E		1
DO-V-43	3	H6		X			1 1/2	SV	SOL	NC/FC	ALL	S/E		1

System Name REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) Dwg. No. M 519 Page 1 of 2

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RCIC-V-1	2	E11		X			3	GT	MO	NO/FAI	ALL	S/E	2	1
RCIC-V-8	1	F6	F				4	GT	MO	NO/FAI	ALL	S/T	4	4
RCIC-V-10	2	B14		X			8	GT	MO	NO/FAI	ALL	S/T	2	
RCIC-V-11	2	B13		X	X		8	CK	SA	NC/NA	ALL	S/E	2	
RCIC-V-13	1	H7	F				6	GT	MO	NC/FAI	CSD	S/T	1k	4
RCIC-V-19	2	E7	T				2	GB	MO	NC/FAI	ALL	S/T		4, 5
RCIC-V-21	2	E8		X	X		2	CK	SA	NC/NA	ALL	S/E	2	
RCIC-V-22	2	J8		X			6	GB	MO	NC/FAI	ALL	S/T	2	
RCIC-V-28	2	D8	F		X		1 1/2	CK	SA	NC/NA	ALL	S/E		4
RCIC-V-30	2	C7		X	X		8	CK	SA	NC/NA	ALL	S/E	2	
RCIC-V-31	2	C7	F				8	GT	MO	NC/FAI	ALL	S/T		4
RCIC-V-40	2	D8	F		X		10	CK	SA	NC/NA	ALL	S/E		4
RCIC-V-45	2	F11		X			4	GB	MO	NC/FAI	ALL	S/T	2, 4	
RCIC-V-46	2	F11		X			2	GB	MO	NC/FAI	ALL	S/T	2	
RCIC-V-59	2	J9		X			6	GT	MO	NC/FAI	ALL	S/T	2	

System Name REACTOR CORE ISOLATION COOLING (RCIC) Dwg. No. M 519

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RCIC-V-63	1	H3	F				10	GT	MO	NO/FAI	ALL	S/T	4	4
RCIC-V-65	1	H6		X	X		6	CK	AO/SA	NC/NA	CSD	S/E	1b, 2	
RCIC-V-66	1	J4	T		X		6	CK	AO/SA	NC/NA	CSD	S/E	1b	4, 5
RCIC-V-68	2	E7	F				10	GT	MO	NO/FAI	ALL	S/T		4
RCIC-V-69	2	D7	F				1-1/2	GT	MO	NO/FAI	ALL	S/T		4
RCIC-V-76	1	H3	F				1	GB	MO	NO/FAI	ALL	S/T	4	4
RCIC-V-086	2	A13		X	X		2	CK	SA	NC/NA	ALL	S/E	2	
RCIC-V-110	2	E7	F				2	GT	MO	NO/FAI	ALL	S/T	4	4
RCIC-V-111	2	E7		X	X		2	CK	SA	NC/NA	ALL	S/E	2, 4a	
RCIC-V-112	2	E7		X	X		2	CK	SA	NC/NA	ALL	S/E	2, 4a	
RCIC-V-113	2	E6	F				2	GT	MO	NO/FAI	ALL	S/T	4	4
RCIC-RD-1	2	D11				X	10	RD	SA	NC/NA	IWV-3620	IWV-3620	2	
RCIC-RD-2	2	C12				X	10	RD	SA	NC/NA	IWV-3620	IWV-3620	2	
RCIC-RV-17	2	C13			X		1 x 1	RV	SA	NC/NA	REFUEL	BENCH TEST	2	
RCIC-RV-19	2	D9			X		1 x 1 1/2	RV	SA	NC/NA	REFUEL	BENCH TEST	2	

System Name LOW PRESSURE CORE SPRAY SYSTEM (LPCS) Dwg. No. M520 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
LPCS-V-1	2	D11	F				24	GT	MO	NO/FAI	ALL	S/T		4
LPCS-V-3	2	B13		X	X		16	CK	SA	NC/NA	ALL	S/E		
LPCS-V-5	1	G11	T				12	GT	MO	NC/FAI	ALL	S/T		4, 5
LPCS-V-6	1	H9	T		X		12	CK	AO	NC/NA	CSD	S/E	1b	4, 5
LPCS-V-12	2	F14	F				12	GB	MO	NC/FAI	ALL	S/T		4
LPCS-V-33	2	C12		X	X		1 1/2	CK	SA	NO/NA	ALL	S/E		
LPCS-V-34	2	C12		X	X		1 1/2	SC	SA/MAN	NO/NA	ALL	S/E		
LPCS-FCV-11	2	B13	F				3	GB	MO	NC/FAI	ALL	S/T		4
LPCS-RV-18	2	F12	F		X		1 1/2 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		4
LPCS-RV-31	2	C12	F		X		1	RV	SA	NC/NA	REFUEL	BENCH TEST		4

System Name HIGH PRESSURE CORE SPRAY SYSTEM (HPCS) Dwg. No. M520 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
HPCS-V-1	2	C6		X			14	GT	MO	NO/FAI	ALL	S/T		
HPCS-V-2	2	C6		X	X		20	CK	SA	NC/NA	ALL	S/E		
HPCS-V-4	1	G7	T				12	GT	MO	NC/FAI	ALL	S/T		4, 5
HPCS-V-5	1	H8	T		X		12	CK	AO	NC/NA	CSD	S/E	1b	4, 5
HPCS-V-6	2	C5		X	X		1 1/2	SC	SA/MAN	NO/NA	ALL	S/E		
HPCS-V-7	2	C5		X	X		1 1/2	CK	SA	NO/NA	ALL	S/E		
HPCS-V-10	2	E3		X			10	GB	MO	NC/FAI	ALL	S/T		
HPCS-V-11	2	E3		X			10	GB	MO	NC/FAI	ALL	S/T		
HPCS-V-12	2	B5	F				4	GT	MO	NC/FAI	ALL	S/T		4
HPCS-V-15	2	D7	F				18	GT	MO	NC/FAI	ALL	S/T		4
HPCS-V-16	2	E6		X	X		24	CK	SA	NC/NA	ALL	S/E		
HPCS-V-23	2	E4	F				12	GB	MO	NC/FAI	ALL	S/T		4
HPCS-V-24	2	B5		X	X		16	CK	SA	NC/NA	ALL	S/E		
HPCS-RV-14	2	C6	F		X		1X1	RV	SA	NC/NA	REFUEL	BENCH TEST		4
HPCS-RV-35	2	C4	F		X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		4

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521 Page 1 of 6

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RHR-V-3A	2	SH 1 H10		X			18	GT	MO	NO/FAI	ALL	S/T		
RHR-V-3B	2	SH 2 J9		X			18	GT	MO	NO/FAI	ALL	S/T		
RHR-V-4A	2	SH 1 B6	F				24	GT	MO	NO/FAI	ALL	S/T		4
RHR-V-4B	2	SH 2 B12	F				24	GT	MO	NO/FAI	ALL	S/T		4
RHR-V-4C	2	SH 2 B11	F				24	GT	MO	NO/FAI	ALL	S/T		4
RHR-V-6A	2	SH 1 B8		X			18	GT	MO	NC/FAI	ALL	S/T		
RHR-V-6B	2	SH 1 B7		X			18	GT	MO	NC/FAI	ALL	S/T		
RHR-V-8	1	SH 1 E6	T				20	GT	MO	NC/FAI	CSD	S/T	1c	4, 5
RHR-V-9	1	SH 1 D5	T				20	GT	MO	NC/FAI	CSD	S/T	1c	4, 5
RHR-V-16A	2	SH 1 H7	F				16	GT	MO	NC/FAI	ALL	S/T		4
RHR-V-16B	2	SH 2 D10	F				16	GT	MO	NC/FAI	ALL	S/T		4
RHR-V-17A	2	SH 1 H6	F				16	GT	MO	NC/FAI	ALL	S/T		4
RHR-V-17B	2	SH 2 D11	F				16	GT	MO	NC/FAI	ALL	S/T		4
RHR-V-21	2	SH 2 E7	F				18	GB	MO	NC/FAI	ALL	S/T		4

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RHR-V-23	1	SH 2 K13	T				6	GB	MO	NC/FAI	CSD	S/T	1c	4, 5
RHR-V-24A	2	SH 1 E10	F				18	GB	MO	NC/FAI	ALL	S/T		4
RHR-V-24B	2	SH 2 C10	F				18	GB	MO	NC/FAI	ALL	S/T		4
RHR-V-27A	2	SH 1 D7	F				6	GT	MO	NC/FAI	ALL	S/T		4
RHR-V-27B	2	SH 2 D10	F				6	GT	MO	NC/FAI	ALL	S/T		4
RHR-V-31A	2	SH 1 D14		X	X		18	CK	SA	NC/NA	ALL	S/E		
RHR-V-31B	2	SH 2 C3		X	X		18	CK	SA	NC/NA	ALL	S/E		
RHR-V-31C	2	SH 2 D5		X	X		18	CK	SA	NC/NA	ALL	S/E		
RHR-V-40	2	SH 2 G4		X			4	GB	MO	NC/FAI	ALL	S/T		
RHR-V-41A	1	SH 1 G5	T		X		14	CK	AO	NC/NA	CSD	S/E	1b	4, 5
RHR-V-41B	1	SH 2 G13	T		X		14	CK	AO	NC/NA	CSD	S/E	1b	4, 5
RHR-V-41C	1	SH 2 E13	T		X		14	CK	AO	NC/NA	CSD	S/E	1b	4, 5
RHR-V-42A	1	SH 1 G7	T				14	GT	MO	NC/FAI	ALL	S/T		4, 5
RHR-V-42B	1	SH 2 G12	T				14	GT	MO	NC/FAI	ALL	S/T		4, 5

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RHR-V-42C	1	SH 2 E11	T				14	GT	MO	NC/FAI	ALL	S/T		4, 5
RHR-V-46A	2	SH 1 C10		X	X		6	CK	SA	NC/NA	ALL	S/E		
RHR-V-46B	2	SH 2 C6		X	X		6	CK	SA	NC/NA	ALL	S/E		
RHR-V-46C	2	SH 2 E8		X	X		6	CK	SA	NC/NA	ALL	S/E		
RHR-V-47A	2	SH 1 J13		X			18	GT	MO	NO/FAI	ALL	S/T		
RHR-V-47B	2	SH 2 J3		X			18	GT	MO	NO/FAI	ALL	S/T		
RHR-V-48A	2	SH 1 J11		X			18	GB	MO	NO/FAI	ALL	S/T		
RHR-V-48B	2	SH 2 J8		X			18	GB	MO	NO/FAI	ALL	S/T		
RHR-V-49	2	SH 2 G4		X			4	GT	MO	NC/FAI	ALL	S/T		
RHR-V-50A	1	SH 1 F5	T		X		12	CK	AO	NC/NA	CSD	S/E	1b	4, 5
RHR-V-50B	1	SH 2 F13	T		X		12	CK	AO	NC/NA	CSD	S/E	1b	4, 5
RHR-V-53A	1	SH 1 E6	T				12	GB	MO	NC/FAI	CSD	S/T	1c	4, 5
RHR-V-53B	1	SH 2 E11	T				12	GB	MO	NC/FAI	CSD	S/T	1c	4, 5
RHR-V-60A	2	SH 1 H11		X			3/4	SV	SOL	NC/FC	ALL	S/E		1
RHR-V-60B	2	SH 2 H8		X			3/4	SV	SOL	NC/FC	ALL	S/E		1

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RHR-V-75A	2	SH 1 G11		X			3/4	SV	SOL	NC/FC	ALL	S/E			1
RHR-V-75B	2	SH 2 G9		X			3/4	SV	SOL	NC/FC	ALL	S/E			1
RHR-V-84A	2	SH 1 D14		X	X		1 1/2	CK	SA	NC/NA	ALL	S/E			
RHR-V-84B	2	SH 2 B3		X	X		1 1/2	CK	SA	NC/NA	ALL	S/E			
RHR-V-84C	2	SH 2 C6		X	X		1 1/2	CK	SA	NC/NA	ALL	S/E			
RHR-V-85A	2	SH 1 D14		X	X		1 1/2	SC	SA/MAN	NO/NA	ALL	S/E			
RHR-V-85B	2	SH 2 B3		X	X		1 1/2	SC	SA/MAN	NO/NA	ALL	S/E			
RHR-V-85C	2	SH 2 C6		X	X		1 1/2	SC	SA/MAN	NO/NA	ALL	S/E			
RHR-V-89	2	SH 2 J10		X	X		14	CK	AO	NC/NA	ALL	S/E			
RHR-V-101A	2	SH 1 E12		X	X		2	CK	SA	NC/NA	ALL	S/E			
RHR-V-101B	2	SH 2 G3		X	X		2	CK	SA	NC/NA	ALL	S/E			
RHR-V-103A	2	SH 1 E12		X	X		2	CK	SA	NC/NA	ALL	S/E			
RHR-V-103B	2	SH 2 G4		X	X		2	CK	SA	NC/NA	ALL	S/E			
RHR-V-115	2	SH 2 J8		X			14	GT	MO	NC/FAI	ALL	S/T			
RHR-V-116	2	SH 2 J9		X			14	GB	MO	NC/FAI	ALL	S/T			

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RHR-V-124A	2	SH 1 B14	F				1-1/2	GB	MO	NC/FAI	ALL	S/T		4
RHR-V-124B	2	SH 1 C12	F				1-1/2	GB	MO	NC/FAI	ALL	S/T		4
RHR-V-125A	2	SH 2 D4	F				1-1/2	GB	MO	NC/FAI	ALL	S/T		4
RHR-V-125B	2	SH 1 D3	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4
RHR-V-134A	2	SH 1 F14	F				2	GB	MO	NC/FAI	ALL	S/T		4
RHR-V-134B	2	SH 2 F5	F				2	GB	MO	NC/FAI	ALL	S/T		4
RHR-V-182	2	SH 2 J8		X			3/4	SV	SOL	NO/FO	ALL	S/E		1
RHR-V-209	1	SH 1 D5	T		X		3/4	CK	SA	NC/NA	REFUEL	S/E		4,5,8
RHR-FCV-64A	2	SH 1 C12	F				3	GB	MO	NO/FAI	ALL	S/T		4,5
RHR-FCV-64B	2	SH 2 C6	F				3	GB	MO	NO/FAI	ALL	S/T		4
RHR-FCV-64C	2	SH 2 E6	F				3	GB	MO	NO/FAI	ALL	S/T		4
RHR-RV-1A	2	SH 1 H13	F		X		3/4 x 1 1/2	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-1B	2	SH 2 H5	F		X		3/4 x 1 1/2	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-5	2	SH 1 C8	F		X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-25A	2	SH 1 E12	F		X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		4

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RHR-RV-25B	2	SH 2 C10	F		X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-25C	2	SH 2 E8	F		X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-30	2	SH 2 C4	F		X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-36	2	SH 1 F12	F		X		6 x 8	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-88A	2	SH 1 C7	F		X		3/4 x 1	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-88B	2	SH 2 B8	F		X		3/4 x 1	RV	SA	NC/NA	REFUEL	BENCH TEST		4
RHR-RV-88C	2	SH 2 D8	F		X		3/4 x 1	RV	SA	NC/NA	REFUEL	BENCH TEST		4

System Name STANDBY LIQUID CONTROL (SLC) Dwg. No. M522 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	Valve Category B	Valve Category C	Valve Category D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
SLC-V-1A	2	E4		X			4	GB	MO	NC/FAI	ALL	S/T		
SLC-V-1B	2	D4		X			4	GB	MO	NC/FAI	ALL	S/T		
SLC-V-4A	1	F8	F			X	1-1/2	SHEAR PLUG	SQUIBB	NC/NA	REFUEL	IWV 3610		4
SLC-V-4B	1	D8	F			X	1-1/2	SHEAR PLUG	SQUIBB	NC/NA	REFUEL	IWV 3610		4
SLC-V-6	1	F11		X	X		1-1/2	CK	SA	NC/NA	REFUEL	S/E		2
SLC-V-7	1	F13	F		X		1-1/2	CK	SA	NC/NA	REFUEL	S/E		2, 4
SLC-V-33A	2	F7		X	X		1-1/2	CK	SA	NC/NA	ALL	S/E		
SLC-V-33B	2	D7		X	X		1-1/2	CK	SA	NC/NA	ALL	S/E		
SLC-RV-29A	2	E6			X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		
SLC-RV-29B	2	D6			X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		

System Name REACTOR WATER CLEANUP (RWCU) Dwg. No. M523 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RWCU-V-1	1	F15	F				6	GT	MO	NO/FAI	ALL	S/T		4
RWCU-V-4	1	E15	F				6	GT	MO	NO/FAI	ALL	S/T		4
RWCU-V-40	1	H11	F				6	GT	MO	NO/FAI	ALL	S/T		4

System Name STANDBY SERVICE WATER (SW) Dwg. No. M524

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
HPCS-V-28	3	Sh 1 G6		X	X		8	CK	SA	NC/NA	ALL	S/E	3	
RHR-V-68A	3	Sh 1 D13		X			16	GT	MO	NO/FAI	ALL	S/T		
RHR-V-68B	3	Sh 2 G14		X			16	GT	MO	NO/FAI	ALL	S/T		
SW-V-1A	3	Sh 1 H5		X	X		20	CK	SA	NC/NA	ALL	S/E	3	
SW-V-1B	3	Sh 2 G5		X	X		20	CK	SA	NC/NA	ALL	S/E	3	
SW-V-2A	3	Sh 1 H6		X			20	BF	MO	NC/FAI	ALL	S/T		
SW-V-2B	3	Sh 2 G6		X			20	BF	MO	NC/FAI	ALL	S/T		
SW-V-4A	3	Sh 1 E9		X			8	GT	MO	NO/FAI	ALL	S/T		
SW-V-4B	3	Sh 2 G9		X			8	GT	MO	NO/FAI	ALL	S/T		
SW-V-4C	3	Sh 1 F7		X			8	GT	MO	NO/FAI	ALL	S/T		
SW-V-12A	3	Sh 1 G3		X			18	GT	MO	NC/FAI	ALL	S/T		
SW-V-12B	3	Sh 2 G3		X			18	GT	MO	NC/FAI	ALL	S/T		
SW-V-24A	3	Sh 1 G9		X			2	GT	MO	NO/FAI	ALL	S/T		
SW-V-24B	3	Sh 2 F10		X			2	GT	MO	NO/FAI	ALL	S/T		
SW-V-24C	3	Sh 2 K10		X			2	GT	MO	NO/FAI	ALL	S/T		
SW-V-29	3	Sh 1 G6		X			8	BF	MO	NC/FAI	ALL	S/T		

System Name STANDBY SERVICE WATER (SW) Dwg. No. M524 M607

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
SW-V-34	3	Sh 2 C11		X			1 1/2	GB	SV	NO/FO	ALL	S/T		
SW-V-44	3	Sh 1 E9		X			2	GT	MO	NO/FAI	ALL	S/T		
SW-V-54	3	Sh 1 F7		X			2	GT	MO	NC/FAI	ALL	S/T		
SW-V-69A	3	Sh 1 G3		X			18	GT	MO	NO/FAI	ALL	S/T		
SW-V-69B	3	Sh 2 F3		X			18	GT	MO	NO/FAI	ALL	S/T		
SW-V-70A	3	Sh 1 G2		X			18	GT	MO	NO/FAI	ALL	S/T		
SW-V-70B	3	Sh 2 F3		X			18	GT	MO	NO/FAI	ALL	S/T		
SW-V-90	3	Sh 2 H8		X			2	GT	MO	NC/FAI	ALL	S/T		
SW-V-92	3	Sh 2 H9		X	X		2	CK	SA	NC/NA	ALL	S/E		
SW-V-201	3	Dwg M607, Sh 2 C14		X			1/2	SV	SOL	NC/FC	ALL	S/E		1
SW-V-202	3	Dwg M607, Sh 2 C14		X			1/2	CK	SA	NC/NA	ALL	S/E		
SW-V-203	3	Dwg M607, Sh 2 C14		X			1/2	CK	SA	NO/NA	ALL	S/E		
SW-V-204	3	Dwg M607, Sh 2 C14		X			1/2	SV	SOL	NO/FO	ALL	S/E		1
SW-V-206	3	Dwg M607, Sh 2 B15		X			1/2	SV	SOL	NC/FC	ALL	S/E		1
SW-V-207	3	Dwg M607, Sh 2 B15		X			1/2	CK	SA	NC/NA	ALL	S/E		
SW-V-208	3	Dwg M607, Sh 2 B15		X			1/2	CK	SA	NO/NA	ALL	S/E		

System Name STANDBY SERVICE WATER (SW) Dwg. No. M524 M607

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
SW-V-209	3	Dwg M607, Sh 2 B15		X			1/2	SV	SOL	NO/FO	ALL	S/E		1
SW-V-210	3	Dwg M607, Sh 2 A11		X			1/2	SV	SOL	NO/FO	ALL	S/E		1
SW-V-211	3	Dwg M607, Sh 2 B11		X			1/2	SV	SOL	NC/FC	ALL	S/E		1
CMS-V-212	3	Dwg M607, Sh 2 A14		X			1/2	SV	SOL	NO/FO	ALL	S/E		1
SW-V-213	3	Dwg M607, Sh 2 B13		X			1/2	SV	SOL	NC/FC	ALL	S/E		1
SW-V-214	3	Dwg 524 Sh 1 C8		X			6	BF	AO	NC/FO	ALL	S/T		
SW-V-215	3	Sh 1 C8		X			6	BF	AO	NC/FO	ALL	S/T		
SW-V-216	3	Sh 2 H8		X			6	BF	AO	NC/FO	ALL	S/T		
SW-V-217	3	Sh 2 H8		X			6	BF	AO	NC/FO	ALL	S/T		
SW-V-75A	3	Sh 1 A13		X			2	GB	MO	NC/FAI	ALL	S/T	5	
SW-V-75B	3	Sh 2 B14		X			2	GB	MO	NC/FAI	ALL	S/T	5	
SW-V-187A	3*	Sh 1 G14		X			6	GT	MO	NC/FAI	ALL	S/T	5, 3	
SW-V-187B	3*	Sh 2 C13		X			6	GT	MO	NC/FAI	ALL	S/T	5, 3	
SW-V-188A	3	Sh 1 H13		X			6	GT	MO	NC/FAI	ALL	S/T	5	
SW-V-188B	3	Sh 2 D12		X			6	GT	MO	NC/FAI	ALL	S/T	5	
SW-RV-001A	3	Sh 1 C14		X	X		1	RV	SA	NC/NA	ALL	BENCH TEST		
SW-RV-001B	3	Sh 2 F14		X	X		1	RV	SA	NC/NA	ALL	BENCH TEST		

System Name REACTOR CLOSED COOLING (RCC) Dwg. No. M525 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category				Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
			A	B	C	D								
RCC-V-5	2	D10	F				10	GT	MO	NO/FAI	CSD	S/T	1d	4
RCC-V-21	2	D10	F				10	GT	MO	NO/FAI	CSD	S/T	1d	4
RCC-V-40	2	D10	F				10	GT	MO	NO/FAI	CSD	S/T	1d	4
RCC-V-104	2	E10	F				10	GT	MO	NO/FAI	CSD	S/T	1d	4
RCC-V-129	3	E5		X			8	GT	MO	NO/FAI	ALL	S/T		
RCC-V-130	3	E6		X			8	GT	MO	NO/FAI	ALL	S/T		
RCC-V-131	3	E6		X			8	GT	MO	NO/FAI	ALL	S/T		
RCC-RV-34A	3	H5		X	X		3/4 x 1	RV	SA	NC/NA	ALL	BENCH TEST	5	
RCC-RV-34B	3	F5		X	X		3/4 x 1	RV	SA	NC/NA	ALL	BENCH TEST	5	

System Name FUEL POOL COOLING SYSTEM (FPC) Dwg. No. M526 - Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
FPC-V-112A	3	D12		X			6	CK	SA	NO/NA	ALL	S/E	5	
FPC-V-112B	3	D12		X			6	CK	SA	NO/NA	ALL	S/E	5	
FPC-V-153	2	B11	F				6	GT	MO	NC/FAI	ALL	S/T	5	4
FPC-V-154	2	B11	F				6	GT	MO	NC/FAI	ALL	S/T	5	4
FPC-V-156	2	C11	F				6	GT	MO	NC/FAI	ALL	S/T	5	4
FPC-V-172	*	C9		X			8	GT	MO	NO/FAI	ALL	S/T	5, 3	
FPC-V-173	*	C8		X			8	GT	MO	NO/FAI	ALL	S/T	5, 3	
FPC-V-175	*	C9		X			8	GT	MO	NC/FAI	ALL	S/T	5, 3	
FPC-V-181A	*	D14		X			8	GT	MO	NO/FAI	ALL	S/T	5, 3	
FPC-V-181B	*	D14		X			8	GT	MO	NO/FAI	ALL	S/T	5, 3	
FPC-V-184	*	C9		X			8	GT	MO	NO/FAI	ALL	S/T	5, 3	
FPC-RV-117A	3	D11			X		3/4 x 1	RV	SA	NC/NA	REFUEL	BENCH TEST	5	
FPC-RV-117B	3	C11			X		3/4 x 1	RV	SA	NC/NA	REFUEL	BENCH TEST	5	

System Name CONTROL ROD DRIVE Dwg. No. M528

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
CRD-V-10	2	K6		X			1	GB	AO	NO/FO	ALL	S/T		
CRD-V-11	2	F6		X			2	GB	AO	NO/FO	ALL	S/T		
CRD-V-110A	2	D13		X			1-1/2	SV	SOL	NO/FO	CSD	S/E	1a	1
CRD-V-110B	2	D13		X			1-1/2	SV	SOL	NO/FO	CSD	S/E	1a	1
CRD-V-111	2	D13		X	X		1-1/2	CK	SA	NC/NA	CSD	S/E	1a	
CRD-V-180	2	K6		X			1	GB	AO	NO/FO	ALL	S/T		
CRD-V-181	2	F6		X			2	GB	AO	NO/FO	ALL	S/T		

System Name MAIN STEAM SYSTEM (MS) Dwg. No. M529

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
MS-V-16	1	B13	F				3	GT	MO	NC/FAI	ALL	S/T		4
MS-V-19	1	B14	F				3	GT	MO	NC/FAI	ALL	S/T		4
MS-V-22A	1	F12	F				26	GB	AO	NO/FC	ALL	S/T		4
MS-V-22B	1	E12	F				26	GB	AO	NO/FC	ALL	S/T		4
MS-V-22C	1	F5	F				26	GB	AO	NO/FC	ALL	S/T		4
MS-V-22D	1	E5	F				26	GB	AO	NO/FC	ALL	S/T		4
MS-V-28A	1	F13	F				26	GB	AO	NO/FC	ALL	S/T		4
MS-V-28B	1	E13	F				26	GB	AO	NO/FC	ALL	S/T		4
MS-V-28C	1	F4	F				26	GB	AO	NO/FC	ALL	S/T		4
MS-V-28D	1	E4	F				26	GB	AO	NO/FC	ALL	S/T		4
MS-V-37 SERIES	2	C6-C11		X	X		10	CK	SA	NC/NA	CSD	S/E	1e	
MS-V-38 SERIES	2	C6-C11		X	X		10	CK	SA	NC/NA	CSD	S/E	1e	
MS-V-67A	1	F13	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4
MS-V-67B	1	F13	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4
MS-V-67C	1	F4	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4

System Name MAIN STEAM SYSTEM (MS) Dwg. No. M529

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
MS-V-67D	1	D4	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4
MS-RV-1A	1	F10		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-1B	1	E11		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-1C	1	F6		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-1D	1	E7		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-2A	1	F10		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-2B	1	E10		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-2C	1	F7		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-2D	1	E7		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-3A	1	F9		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-3B	1	E9		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-3C	1	F7		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST		
MS-RV-3D	1	E8		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST	ADS	
MS-RV-4A	1	F9		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST	ADS	
MS-RV-4B	1	E9		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST	ADS	
MS-RV-4C	1	F8		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST	ADS	

System Name MAIN STEAM SYSTEM (MS) Dwg. No. M529 Page 3 of 3

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
MS-RV-4D	1	E8		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST	ADS	
MS-RV-5B	1	E9		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST	ADS	
MS-RV-5C	1	F8		X	X		6 x 10	S/R	AO/SA	NC/NA	REFUEL	BENCH TEST	ADS	

System Name REACTOR FEEDWATER SYSTEM (RFW) Dwg. No. M529

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RFW-V-10A	1	G12	F		X		24	CK	SA	NO/NA	CSD	S/E	1f	4
RFW-V-10B	1	G5	F		X		24	CK	SA	NO/NA	CSD	S/E	1f	4
RFW-V-32A	1	G13	F		X		24	CK	AO	NO/NA	CSD	S/E	1f	4
RFW-V-32B	1	G5	F		X		24	CK	AO	NO/NA	CSD	S/E	1f	4
RFW-V-65A	1	G13	F				24	GT	MO	NO/FAI	CSD	S/T	1f	4
RFW-V-65B	1	G4	F				24	GT	MO	NO/FAI	CSD	S/T	1f	4

System Name REACTOR RECIRCULATION COOLING (RRC, HY) Dwg. No. M530 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
RRC-V-13A	2	C13	F		X		3/4	CK	SA	NO/NA	CSD	S/E	1j	4
RRC-V-13B	2	B13	F		X		3/4	CK	SA	NO/NA	CSD	S/E	1j	4
RRC-V-16A	2	C14	F				3/4	GT	MO	NO/NA	CSD	S/T	1j	4
RRC-V-16B	2	B14	F				3/4	GT	MO	NO/NA	CSD	S/T	1j	4
RRC-V-19	1	F11	F				3/4	SV	SOL	NC/FC	ALL	S/E		1, 4
RRC-V-20	1	F12	F				3/4	SV	SOL	NC/FC	ALL	S/T		1, 4
HY-V-17A, B	2	E4, E13	F				3/4	GT	SOL	NO/FC	CSD	S/E	1g	1, 4
HY-V-18A, B	2	E4, E13	F				3/4	GT	SOL	NO/FC	CSD	S/E	1g	1, 4
HY-V-19A, B	2	E4, E13	F				3/4	GT	SOL	NO/FC	CSD	S/E	1g	1, 4
HY-V-20A, B	2	E4, E13	F				3/4	GB	SOL	NO/FC	CSD	S/E	1g	1, 4
HY-V-33A, B	2	E4, E13	F				3/4	GT	SOL	NO/FC	CSD	S/E	1g	1, 4
HY-V-34A, B	2	E4, E13	F				3/4	GT	SOL	NO/FC	CSD	S/E	1g	1, 4
HY-V-35A, B	2	E4, E13	F				3/4	GT	SOL	NO/FC	CSD	S/E	1g	1, 4
HY-V-36A, B	2	E4, E13	F				3/4	GB	SOL	NO/FC	CSD	S/E	1g	1, 4

System Name EQUIPMENT DRAIN RADIOACTIVE (EDR) Dwg. No. M537 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category				Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
			A	B	C	D								
EDR-V-19	2	D9	F				3	GT	AO	NO/FC	ALL	S/T		4
EDR-V-20	2	D9	F				3	GT	AO	NO/FC	ALL	S/T		4

System Name FLOOR DRAIN RADIOACTIVE (FDR) Dwg. No. M539

Valve Number	Class	Coordinates	Valve Category				Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
			A	B	C	D								
FDR-V-3	2	D6	F				3	GT	AO	NO/FC	ALL	S/T		4
FDR-V-4	2	D6	F				3	GT	AO	NO/FC	ALL	S/T		4

System Name PRIMARY CONTAINMENT COOLING & PURGE (CSP, CEP) Dwg. No. M543

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
CSP-V-1	2	D6	F				30	BF	AO	NC/FC	ALL	S/T		4
CSP-V-2	2	D6	F				30	BF	AO	NC/FC	ALL	S/T		4
CSP-V-3	2	C5	F				24	BF	AO	NC/FC	ALL	S/T		4
CSP-V-4	2	C5	F				24	BF	AO	NC/FC	ALL	S/T		4
CSP-V-5	2	C5	F				24	BF	AO	NC/FO	ALL	S/T		4
CSP-V-6	2	B14	F				24	BF	AO	NC/FO	ALL	S/T		4
CSP-V-7	2	C5	F		X		24	CK	AO/SA	NC/NA	ALL	S/E		4
CSP-V-8	2	B14	F		X		24	CK	AO/SA	NC/NA	ALL	S/E		4
CSP-V-9	2	B6	F				24	BF	AO	NC/FO	ALL	S/T		4
CSP-V-10	2	B6	F		X		24	CK	AO/SA	NC/NA	ALL	S/E		4
CEP-V-1A	2	J13	F				30	BF	AO	NC/FC	ALL	S/T		4
CEP-V-2A	2	J13	F				30	BF	AO	NC/FC	ALL	S/T		4
CEP-V-3A	2	C14	F				24	BF	AO	NC/FC	ALL	S/T		4
CEP-V-4A	2	C14	F				24	BF	AO	NC/FC	ALL	S/T		4
CEP-V-1B	2	J13	F				2	GB	AO	NC/FC	ALL	S/T		4

System Name PRIMARY CONTAINMENT COOLING & PURGE (CEP, CVB) Dwg. No. M543 Page 2 of 3

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
CEP-V-2B	2	J13	F				2	GB	AO	NC/FC	ALL	S/T		4
CEP-V-3B	2	C14	F				2	GB	AO	NC/FC	ALL	S/T		4
CEP-V-4B	2	C14	F				2	GB	AO	NC/FC	ALL	S/T		4
CVB-V-1A	2	B12	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1B	2	B12	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1C	2	B12	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1D	2	B12	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1E	2	B11	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1F	2	B11	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1G	2	B11	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1H	2	B11	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1J	2	B9	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1K	2	B9	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1L	2	B8	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1M	2	B8	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6

System Name PRIMARY CONTAINMENT COOLING & PURGE (CVB, PI) Dwg. No. M543

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
CVB-V-1N	2	B8	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1P	2	B8	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1Q	2	B7	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1R	2	B7	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1S	2	B7	X		X		24	CK	AO/SA	NC/NA	ALL	S/E		6
CVB-V-1T	2	B7	X		X		24	CK	AO	NC/NA	ALL	S/E		6
PI-VX-250	2	F13	F				1	SV	SOL	NO/FC	ALL	S/E		1, 4
PI-VX-251	2	F13	F				1	SV	SOL	NO/FC	ALL	S/E		1, 4
PI-VX-253	2	F13	F				1	SV	SOL	NO/FC	ALL	S/E		1, 4
PI-VX-256	2	F7	F				1	SV	SOL	NO/FC	ALL	S/E		1, 4
PI-VX-257	2	F7	F				1	SV	SOL	NO/FC	ALL	S/E		1, 4
PI-VX-259	2	F7	F				1	SV	SOL	NO/FC	ALL	S/E		1, 4
PI-CVX-72f	2	F12	F		X		1	CK	SA	NC/NA	CSD	S/E	1h	4
PI-CVX-73e	2	F7	F		X		1	CK	SA	NC/NA	CSD	S/E	1h	4

System Name CONTAINMENT ATMOSPHERE CONTROL (CAC) Dwg. No. M554

ACCIDENT MITIGATION

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
CAC-V-1A	2	F15		X			2	DIA	HO	NC/FC	ALL	S/T		
CAC-V-1B	2	F1		X			2	DIA	HO	NC/FC	ALL	S/T		
CAC-V-2	2	G10	F				4	GT	MO	NC/FAI	ALL	S/T		4
CAC-V-2A	2	F12		X			4	DIA	HO	NC/FC	ALL	S/T		
CAC-V-2B	2	F5		X			4	DIA	HO	NC/FC	ALL	S/T		
CAC-V-4	2	E10	F				4	GT	MO	NC/FAI	ALL	S/T		4
CAC-V-6	2	H10	F				4	GT	MO	NC/FAI	ALL	S/T		4
CAC-V-8	2	D10	F				4	GT	MO	NC/FAI	ALL	S/T		4
CAC-V-11	2	G6	F				4	GT	MO	NC/FAI	ALL	S/T		4
CAC-V-13	2	E6	F				4	GT	MO	NC/FAI	ALL	S/T		4
CAC-V-15	2	H6	F				4	GT	MO	NC/FAI	ALL	S/T		4
CAC-V-17	2	D6	F				4	GT	MO	NC/FAI	ALL	S/T		4
CAC-FCV-1A	2	H10	F				2-1/2	GB	HO	NC/FC	ALL	S/T		4
CAC-FCV-1B	2	H6	F				2-1/2	GB	HO	NC/FC	ALL	S/T		4
CAC-FCV-2A	2	G10	F				2-1/2	GB	HO	NC/FC	ALL	S/T		4

System Name CONTAINMENT ATMOSPHERE CONTROL (CAC) Dwg. No. M554

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
CAC-FCV-2B	2	G6	F				2-1/2	GB	HO	NC/FC	ALL	S/T		4
CAC-FCV-3A	2	D10	F				2-1/2	GB	HO	NC/FC	ALL	S/T		4
CAC-FCV-3B	2	D6	F				2-1/2	GB	HO	NC/FC	ALL	S/T		4
CAC-FCV-4A	2	F10	F				2-1/2	GB	HO	NC/FC	ALL	S/T		4
CAC-FCV-4B	2	E6	F				2-1/2	GB	HO	NC/FC	ALL	S/T		4
CAC-FCV-5A	2	F14		X			1	GB	HO	NC/FC	ALL	S/T		
CAC-FCV-5B	2	F2		X			1	GB	HO	NC/FC	ALL	S/T		
CAC-RD-1A	2	D12				X	2	RD	SA	NC/NA	IWV-3620	IWV-3620		
CAC-RD-1B	2	D3				X	2	RD	SA	NC/NA	IWV-3620	IWV-3620		
CAC-RV-63A	2	E12			X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		
CAC-RV-63B	2	E4			X		1 x 2	RV	SA	NC/NA	REFUEL	BENCH TEST		
CAC-RV-65A	2	D13			X		1 1/2 x 3	RV	SA	NC/NA	REFUEL	BENCH TEST		
CAC-RV-65B	2	D4			X		1 1/2 x 3	RV	SA	NC/NA	REFUEL	BENCH TEST		

System Name CONTAINMENT INSTRUMENT AIR (CIA) Dwg. No. M556 Page 1 of 2

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
CIA-V-20	2	J6	F				3/4	GB	MO	NO/FAI	ALL	S/T		4
CIA-V-21	2	J4	F		X		3/4	CK	SA	NO/NA	REFUEL	S/E		3, 4
CIA-V-30A	2	H6	F				1/2	GB	MO	NO/FAI	ALL	S/T		4
CIA-V-30B	2	F6	F				1/2	GB	MO	NO/FAI	ALL	S/T		4
CIA-V-31A	2	H5	F		X		1/2	CK	SA	NO/NA	REFUEL	S/E		3, 4
CIA-V-31B	2	E6	F		X		1/2	CK	SA	NO/NA	REFUEL	S/E		3, 4
CIA-V-36M	2	B4	X		X		1/2	CK	SA	NC/NA	REFUEL	S/E		3, 7
CIA-V-36N	2	B4	X		X		1/2	CK	SA	NC/NA	REFUEL	S/E		3, 7
CIA-V-36P	2	B4	X		X		1/2	CK	SA	NC/NA	REFUEL	S/E		3, 7
CIA-V-36R	2	B4	X		X		1/2	CK	SA	NC/NA	REFUEL	S/E		3, 7
CIA-V-36S	2	B4	X		X		1/2	CK	SA	NC/NA	REFUEL	S/E		3, 7
CIA-V-36U	2	B4	X		X		1/2	CK	SA	NC/NA	REFUEL	S/E		3, 7
CIA-V-36V	2	B4	X		X		1/2	CK	SA	NC/NA	REFUEL	S/E		3, 7
CIA-V-39A	3	H7		X			1/2	SV	SOL	NO/FC	CSD	S/E	11	1
CIA-V-39B	3	F7		X			1/2	SV	SOL	NO/FC	CSD	S/E	11	1

System Name CONTAINMENT INSTRUMENT AIR (CIA) Dwg. No. M556

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
CIA-V-40 SERIES	2	H5-B5	X		X		1/2	CK	SA	NO/NA	REFUEL	S/E	TYP. OF 7	3, 7
CIA-V-41A	3	H7		X	X		1/2	CK	SA	NO/NA	CSD	S/E	11	
CIA-V-41B	3	F7		X	X		1/2	CK	SA	NO/NA	CSD	S/E	11	
CIA-SPV-1B thru 19B	3	E8		X			1/2	SN	SO1	NC/FO	ALL	S/E		1
CIA-SPV-1A thru 15A	3	H8		X			1/2	SN	SO1	NC/FO	ALL	S/E		1
CIA-V-52B thru 70B	3	E8		X	X		1/2	CK	SA	NC/NA	ALL	S/E		
CIA-V-52A thru 66A	3	H8		X	X		1/2	CK	SA	NC/NA	ALL	S/E		
CIA-RV-5A	3	H8			X		3/4	RV	SA	NC/NA	ALL	BENCH TEST		
CIA-RV-5B	3	F8			X		3/4	RV	SA	NC/NA	ALL	BENCH TEST		
CIA-V-103A	3	H9		X	X		1/2	CK	SA	NC/NA	ALL	S/E		
CIA-V-103B	3	F9		X	X		1/2	CK	SA	NC/NA	ALL	S/E		

System Name MAIN STEAM LEAKAGE CONTROL (MSLC) Dwg. No. M557 Page 1 of 1

Valve Number	Class	Coordinates	Valve Category A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal/ Failed Position	Test During	Test	Notes	Requests For Relief
MSLC-V-1A	2	B7		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-1B	2	B5		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-1C	2	D7		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-1D	2	D5		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-2A	1	C8		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-2B	1	C8		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-2C	1	E8		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-2D	1	E8		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-3A	1	C9	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4
MSLC-V-3B	1	C8	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4
MSLC-V-3C	1	E8	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4
MSLC-V-3D	1	E8	F				1-1/2	GT	MO	NC/FAI	ALL	S/T		4
MSLC-V-4	2	J5		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-5	2	J5		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-9	2	H5		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		
MSLC-V-10	2	H5		X			1-1/2	GT	MO	NC/FAI	ALL	S/T		

1. Valve Exercising Test Frequency -- Exceptions

IWV-3411 states that category A and B valves shall be exercised at least once every 3 months, except as provided by IWV-3412(a). IWV-3412(a) states:

Valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation, the valve shall be part-stroke exercised during plant operation and full stroke exercised during cold shutdowns. Valves that cannot be exercised during plant operations shall be specifically identified by the Owner and shall be full-stroke exercised during cold shutdowns.

Furthermore, NRC Guideance, Draft Reg. Guide MS901-4, states "valves which when exercised (cycled) could put the plant in an unsafe condition" should be excluded from testing or deferred until appropriate plant test conditions are provided.

The following valves are specifically identified by the Owner as being impractical to exercise during plant operations and will therefore be full-stroke exercised during cold shutdowns. The testing of these valves shall commence immediately (within 24 hours) following the establishment of cold shutdown conditions in accordance with the owner's established schedule. Testing shall continue only as long as the plant is scheduled to be in cold shutdown to perform required maintenance. During each cold shutdown, testing shall commence with the next valve in succession after the previous cold shutdown. All of these valves will be tested during each refueling outage. The valves are identified by unique valve numbers and Code identification as to Code Class and Valve Category.

a)

Valve Number	Code Id.	Function
CRD-V-110A, B	2, B	Provides a redundant means of depressurizing the scram valve diaphragms.
CRD-V-111	2, B-C	

Justification--Cycling the valves would result in scramming the reactor, therefore this testing shall be done during cold shutdown plant conditions.

b)

Valve Number	Code Id.	Function
RCIC-V-65, 66	1, A-C	RCIC discharge to the reactor vessel head
LPCS-V-6	1, A-C	LPCS discharge to the reactor vessel
HPCS-V-5	1, A-C	HPCS discharge to the reactor vessel
RHR-V-41A, B, C	1, A-C	RHR Loop A, B, C discharge to the reactor vessel
RHR-V-50A, B	1, A-C	RHR Loop A, B discharge to the recirculating pump discharge

Justification--Valves cannot be opened against the differential pressure which exists across them during power operations. Reactor coolant system pressure holds the valves closed. Also, valves are located inside the containment (except RCIC-V-65) and cannot be temporarily isolated to allow testing.

c) Valve Number | Code Id. | Function

Valve Number	Code Id.	Function
RHR-V-8	1, A	Isolation valves in RHR shutdown cooling suction line from recirculation loop A
RHR-V-9	1, A	
RHR-V-23	1, A	RHR supply to vessel head spray
RHR-V-53A, B	1, A	Loop A, B outborad isolation valve for shutdown cooling return

Justification--Valves are interlocked with reactor coolant system pressure such that valves automatically close to protect the RHR pump suction line from elevated reactor coolant system pressures. Opening circuit is disabled by the same pressure interlocks. Over pressurization of the suction line may cause the loss of shutdown RHR cooling capability. Interlocks cannot be bypassed with normal control circuits.

d)

Valve Number	Code Id.	Function
RCC-V-5	2, A	Isolation valves for reactor closed cooling water lines
RCC-V-21	2, A	
RCC-V-40	2, A	
RCC-V-104	2, A	

Justification--Closure of any isolation valve will interrupt cooling water flow to the Reactor Recirculation (RRC) Pump seals, to the RRC pump motor coolers and to the Drywell Air Coolers possibly causing failure of this equipment. The risks associated with failure of this equipment outweigh any potential benefits from quarterly testing of these valves.

e)

Valve Number	Code Id.	Function
MS-V-37 Series	2, BC	Vacuum breakers for 18 main steam relief line downcomers.
MS-V-38 Series	2, BC	

Justification--Valves have no power operator by which they may be stroked remotely. Valves are located inside primary containment and, consequently, are inaccessible during power operations.

f)

Valve Number	Code Id.	Function
RFW-V-10A, B	1, A-C	Reactor feedwater inboard check valves
RFW-V-32A, B	1, A-C	Reactor feedwater outboard check valves
RFW-V-65A, B	1, A	Reactor feedwater stop valves

Justification
1) Closure of either Category A valve (RFW-V-65A, 65B) would result in a loss of flow to the reactor vessel and cause a significant reduction of reactor coolant inventory.
2) Category A-C valves are held open by feedwater flow and cannot be closed during power operations.

g) Valve Number | Code Id. | Function

Valve Number	Code Id.	Function
HY-V-17A, B	2, B	Valves provide hydraulic control fluid to the reactor recirculation flow control valve hydraulic operators. Recirculation flow control valves are RRC-V-60A and RCC-V-60B.
HY-V-18A, B	2, B	
HY-V-19A, B	2, B	
HY-V-20A, B	2, B	
HY-V-33A, B	2, B	
HY-V-34A, B	2, B	
HY-V-35A, B	2, B	
HY-V-36A, B	2, B	

Justification--Exercising of the hydraulic valves may cause repositioning of the reactor recirculation flow control valve, causing undesirable reactivity changes in the core.

h)

Valve Number	Code Id.	Function
PI-CVX-72f	1, A-C	Containment isolation, located on discharge lines of Radiation Leak Detection Monitors, penetrations X-73e, X-72f.
PI-CVX-73e	1, A-C	

Justification--These containment isolation check valves are located inside the containment and can only be observed/tested during cold shutdown conditions.

i)

Valve Number	Code Id.	Function
CIA-V-39A, B	3, B	These valves cross connect the normal nitrogen supply for the Main Steam Isolation Valves and Main Steam Relief Valves (including the 7ADS Valves) accumulators to the backup nitrogen supply for the 7ADS valves.
CIA-V-41A, B	3, B-C	

Justification--Testing these valves requires securing the backup nitrogen supply to the ADS valve accumulators. This is unsafe to do while the plant is operating.

j)

Valve Number	Code Id.	Function
RRC-V-13A, B	2, A-C	Inboard and outboard isolation valves for the recirculation pumps seal purge line.
RRC-V-16A, B	2, A	

Justification--Closure of Category A valves (RCC-V-16A, B) would terminate seal purge water flow to recirculation Pump 1A or 1B, respectively. Loss of purge flow may result in excessive seal wear and possibly failure of the seal. The risk associated with seal failure are greater than the benefits gained by quarterly valve testing.

Category A-C valves (RRC-V-13A, B) are held open by purge water flow and cannot be closed during power operations.

k)

Valve Number	Code Id.	Function
RCIC-V-13	1, A	RCIC pump discharge isolation valve and containment isolation.

Justification--Opening this valve during normal power operations will result in tripping the main turbine generator off line.

2. Only those valves which are required to perform a specific function in shutting down a reactor to the cold shutdown condition or in mitigating the consequences of an accident are required to be tested per Subsection IWV of the Code. Using this criteria the following valves are not required to be tested per Subsection IWV, but due to their functional importance are included in the valve list.

   RCIC-V-1, 10, 11, 21, 22, 30, 45, 46, 59, 65, 086, 111, 112
   RCIC-RV-17, 19
   RCIC-RD-1, 2

3. These valves are not ASME Class III. They have been assigned Washington State Special Numbers and are considered as SA105 material welded to an ASME code system pressure boundary.

   SW-V-187A, B
   FPC-V-172, 173, 175, 181A, 181B, 184

4. Valve closes automatically if Reactor Vessel pressure is less than 47 psig. Therefore, if cold shutdown conditions extend beyond a 3 month period, IWV testing frequency may not be met. However, valves will be tested prior to resuming power operations as per IWV-3416.

   RCIC-V-8, 45, 63, 76, 110, 113

   a. RCIC-V-111 and V-112 are check valves isolated by RCIC-V-110 and V-113 which close automatically if reactor vessel pressure is less than 47 psig.

5. These valves are not required to be in service until the fuel pool cooling system is placed in service. It is not expected to be placed in service until the first refueling outage at which time this test program will be implemented as per IWV-3416.

   SW-V-75A, 75B, 187A, 187B, 188A, 188B
   RCC-RV-34A, B
   FPC-V-112A, 112B, 153, 154, 156, 172, 173, 175, 181A, 181B, 184
   FPC-RV-117A, B

4.5 Requests for Relief from Certain Code Requirements

Relief Requests are presented to document differences between the Code and WNP-2's Valve Test Program. The requests include technical justification for the differences and, where appropriate, propose alternate testing.

REQUEST FOR RELIEF NO. RV-1

System	Various
Valve(s) ASME Classification Function	Valves affected by this relief request are identified in TABLE A.
Code Testing Requirement	1. Timing of valve stroke (IWV-3413)
Basis for Relief	1. Solenoid valves and the RCIC turbine throttle trip valve are very rapid acting, with stroke times much less than one second. It is meaningless to measure their stroke times "to the nearest second".
Alternate Testing to be Performed	1. Valves will be full stroke tested. Satisfactory operation of equipment downstream of the solenoid valve will constitute satisfactory valve operation.

Quality/Safety Impact

The only valves in Table A for which timing might be an important parameter are the Category A valves which are containment isolation valves. However, these valves have position indication displayed in the Control Room and on the Transient Data Acquisition System. Furthermore, each of the Category A valves have backup valves which can be used to isolate the line should it be required.

The proposed exercise testing and regular position indication verification will provide adequate assurance of quality and public safety.

RV-1

TABLE A

Valve	Code Class	Category	Function
HY-V-17A, B	2	B	Hydraulic supply for Reactor Recirculation Flow Control Valves
HY-V-18A, B	2	B	
HY-V-19A, B	2	B	
HY-V-20A, B	2	B	
HY-V-33A, B	2	B	
HY-V-34A, B	2	B	
HY-V-35A, B	2	B	
HY-V-36A, B	2	B	
RRC-V-19	1	A	Reactor recirculation sampling Iso valve.
RRC-V-20	1	A	Reactor recirculation sampling Iso valve.
CIA-V-39A	3	B	Cross ties between air and nitrogen headers.
CIA-V-39B	3	B	
DO-V-40A	3	B	Diesel fuel oil day tank 3A inlet valve
DO-V-40B	3	B	Diesel fuel oil day tank 3B inlet valve
DO-V-43	3	B	Diesel fuel oil day tank 3C inlet valve
CRD-V-110A	2	B	Back-up Scram Valve (Air Supply)
CRD-V-110B	2	B	Back-up Scram Valve (Air Supply)
CIA-SPV-1B thru 19B	3	B	Nitrogen Bottles' Isolation Valves
CIA-SPV-1A thru 15A	3	B	Nitrogen Bottles' Isolation Valves

RV-1

TABLE A (Cont'd)

Valve	Code Class	Category	Function
PI-VX-251	2	A	Radiation monitor RAD-RE-12B inlet valve
PI-VX-250	2	A	Radiation monitor RAD-RE-12B outlet valve
PI-VX-253	2	A	Radiation monitor RAD-RE-12B outlet valve
PI-VX-256	2	A	Radiation monitor RAD-RE-12A inlet valve
PI-VX-257	2	A	Radiation monitor RAD-RE-12A inlet valve
PI-VX-259	2	A	Radiation monitor RAD-RE-12A outlet valve
PI-VX-262	2	A	H_2, O_2 monitor inlet and outlet valves (S-SR-13)
PI-VX-263	2	A	
PI-VX-264	2	A	
PI-VX-265	2	A	
PI-VX-266	2	A	H_2, O_2 monitor inlet and outlet valves (S-SR-14)
PI-VX-267	2	A	
PI-VX-268	2	A	
PI-VX-269	2	A	
RHR-V-60A	2	B	Loop A sample (inboard)
RHR-V-60B	2	B	Loop B sample (inboard)
RHR-V-75A	2	B	Loop A sample (outboard)
RHR-V-75B	2	B	Loop B sample (outboard)
RHR-V-182	2	B	Drain Vlv between Valves isolating Service Water from RHR

RV-1

TABLE A (Cont'd)

Valve	Code Class	Category	Function
SW-V-201	3	B	Cooling Water to H_2, O_2 analyzers S-SR-13, 14.
SW-V-204	3	B	
SW-V-206	3	B	
SW-V-209	3	B	
SW-V-210	3	B	
SW-V-211	3	B	
SW-V-212	3	B	
SW-V-213	3	B	
RCIC-V-1	2	B	RCIC Turbine Throttle Trip Valve.

REQUEST FOR RELIEF NO. RV-2

System	Standby Liquid Control (SLC)
Valve(s)	SLC-V-6, SLC-V-7
ASME Classification	Code Class: 1 Category: B-C (SLC-V-6) A-C (SLC-V-7)
Function	Standby Liquid Control discharge to reactor vessel.
Code Testing Requirement	1) Quarterly exercising (IWV-3521) 2) Cold shutdown exercising (IWV-3522)
Basis for Relief	1. Valves have no operator with which they may be stroked. 2. Exercising the valves require the initiation of the SLC system and full flow injection into the reactor vessel. Initiation of SLC flow involves the discharge of Category D explosively activated valves.
Alternate Testing to be Performed	At least once per 18 months, one of the Standby Liquid Control System loops, including the associated explosive valve, will be initiated. A flow path to the Reactor Vessel will be verified by pumping demineralized water to the vessel. Valve closure capability will be verified in conjunction with 10CFR50 Appendix J (Type C) testing.

<u>Quality/Safety Impact</u>

The proposed testing complies fully with the intent of the Code (IWV-3522). Additionally it is noted that the SLC system will be required to perform its safety function only under very infrequent circumstances (ATWS). The proposed testing provides adequate assurances of quality and public safety.

REQUEST FOR RELIEF NO. RV-3

System	Containment Instrument Air
Valve(s)	
ASME Classification	Valves affected by this relief request are identified in TABLE C.
Function	
Code Testing Requirement	Quarterly testing (IWV-3412) Position indication verification (IWV-3522)
Basis for Relief	1. The 40 series and 36 series valves are located inside the containment and are inaccessible during power operations. There is no way to remotely isolate the valves and observe the pressure decay of the accumulators. 2. There is no local or remote position indication for these check valves.
Alternate Testing to be Performed	1. During refueling outages, pressure decay tests will be performed for the accumulators associated with the Main Steam Safety/Relief Valves in order to verify closure ability of 40 series and 36 series valves. Each accumulator will be tested at least every two years. 2. Closure ability of CIA-V-21, 31A, and 31B will be verified by normal 10CFR50, Appendix J (Type C) testing.

Quality/Safety Impact

The proposed testing qualitatively verifies valve closure on the most practical regular basis. This satisfies the intent of the Code (IWV-3412). Valve opening is verified when the accumulators are pressurized in preparation for the pressure decay test.

The valves in Table C are in the pneumatic supply to the auto-depressurization System valves, a safety related system. However, the proposed alternate testing together with the redundancy of the pneumatic supplies and individual accumulators, of the ADS valves themselves and of the high pressure injections systems assures an acceptable level of quality and public safety.

RV-3

TABLE C

Valve	Code Class	Category	Function
CIA-V-31A CIA-V-31B	2 2	A-C A-C	Instrument air supply to ADS valves (outside containment)
CIA-V-40 series (7 valves)	2	A-C	Instrument air to ADS Accumulators (inside containment)
CIA-V-36M, N, P, R, S, U, and V	2	A-C	Instrument air supply to Main Steam Relief Valves' Accumulators (inboard check valve)
CIA-V-21	2	A-C	Instrument air supply to containment (outboard check valve).

REQUEST FOR RELIEF NO. RV-4

System	Various
Valves	See WNP-2 FSAR, Table 6.2-16
ASME Classification	Code Class: 1 and 2 Category: A, A-C
Function	Containment Isolation
Code Testing Requirement	1. Leak Test Requirements (IWV-3420)
Basis for Relief	1. The purpose of leak rate testing is, ultimately, to assure that the limits of 10CFR100 are not exceeded. Hence the overall leakage from the containment is the critical parameter in leak rate testing, not individual valve leak rates. Appendix J Leak Test requirements specifically address leakage requirements for valves functioning as containment isolation valves.
Alternate Testing to be Performed	1. These valves will be leak tested using the requirements of 10CFR50, Appendix J in lieu of IWV-3420.

Quality/Safety Impact

These valves are all category A valves and whether active or passive perform a common safety function of containment isolation. The Appendix J requirements recognize this safety function and provides leak test requirements based on this safety function. The proposed alternate testing provides adequate assurance of quality and public safety.

REQUEST FOR RELIEF NO. RV-5

System	Various
Valves	See WNP-2 Technical Specification (Table 3.4.3.2-1)
ASME Classification	Code Class: 1 and 2 Category: A, A-C
Function	Reactor Coolant System Pressure Isolation and Containment Isolation
Code Testing Requirement	1. IWV-3427, Corrective Action
Basis for Relief	1. The WNP-2 Technical Specification establishes limiting leak rates for each valve and describes the necessary corrective action if these limits are exceeded. Furthermore, these valves are additionally leak tested using Appendix J requirements to verify the valves' safety function as a containment isolation valve.
Alternate Testing to be Performed	1. These valves will be leak tested at least once every 18 months and if the leakage exceeds the specified limit, the corrective actions specified in the WNP-2 Technical Specification will be followed.

<u>Quality/Safety Impact</u>

These valves perform a dual safety function. They are identified in the WNP-2 FSAR as containment isolation valves and as such, will be leak tested using the requirements of 10CFR50, Appendix J. In addition to this, the WNP-2 Technical Specification identifies these valves as reactor coolant system pressure isolation valves and as such, will be leak tested again using the IWV requirements. Compliance with the WNP-2 Technical Specification and Appendix J leak test requirements provides adequate assurance of material quality and public safety.

REQUEST FOR RELIEF NO. RV-6

System	Primary Containment Cooling and Purge
Valves	CVB-V-1A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T
ASME Classification	Code Class: 2 Category: A-C
Function	To break vacuum on the drywell to suppression chamber downcomers and to limit steam leakage from the downcomer to the drywell.
Code Testing Requirement	1. IWV-3426, That the owner assign limiting leak rates for a specific valve. 2. IWV-3427, Corrective Action
Basis for Relief	1. These check valves cannot be tested individually, therefore, assigning a limiting leakage rate for each valve is not practical. The purpose of this leak rate test is to assure that the leakage from the suppression pool chamber to the drywell does not exceed Technical Specification limits. The WNP-2 Technical Specification specifies conservative corrective actions commensurate with the importance of the safety function being performed by these valves.
Alternate Testing to be Performed	1. These valves will be leak tested according to WNP-2 Technical Specifications, at least once per 18 months by conducting a drywell-to-suppression chamber bypass leak test. Corrective actions will be as specified in the Technical Specification.

Quality/Safety Impact

The leakage criteria and corrective actions specified in the WNP-2 Technical Specification is the most practical approach to assessing the adequacy of these valves in performing their specified safety function. Following the WNP-2 Technical Specification provides adequate assurance of material quality and public safety.

REQUEST FOR RELIEF NO. RV-7

System	Containment Instrument Air
Valves	CIA-V-36M, N, P, R, S, U, V CIA-V-40M, N, P, R, S, U, V
ASME Classification	Code Class: 2 Category: A-C
Function	These valves isolate the accumulators for the Auto Depressurization System (ADS) valves in the event that the supply line is broken or the pressure source is depressurized.
Code Testing Requirement	1. IWV-3426, That the owner assign a limiting leak rate to a specific valve.
Basis for Relief	1. These check valves cannot be tested individually, therefore, assigning a limiting leakage rate for each valve is not practical.
Alternate Testing to be Performed	1. These check valves will be leak tested during a pressure decay test on the accumulators. Acceptance criteria will be based on the valves' ability to perform their safety function.

Quality/Safety Impact

The valves will be divided into groups and tested. The acceptance criteria will be based on the valves' ability to perform its safety function. The proposed alternate testing provides adequate assurance of material quality and public safety.

REQUEST FOR RELIEF NO. RV-8

System	Residual Heat Removal
Valves	RHR-V-209
ASME Classification	Code Class: 1 Category: A-C
Function	Containment isolation and Reactor Coolant System Pressure Boundary and pressure relief for piping between valves RHR-V-8 and 9.
Code Testing Requirement	1. IWV-3411, that each category A valve be exercised at least once every 3 months.
Basis for Relief	1. This check valve is located inside the containment does not have valve position indication or an operator of any type. It cannot be tested without interrupting RHR shutdown cooling flow. During power operations, access is prohibited. During cold shutdown conditions, RHR cannot be out of service more than 2 hours per an 8 hour interval (per WNP-2 Technical Specification). Additionally, containment will not be deinerted during all cold shutdowns.
Alternate Testing to be Performed	1. These check valves will be exercised at refueling outages. Furthermore, this check valve is verified to shut by being leak tested at least once every 18 months in compliance with Appendix J and IWV requirements.

Quality/Safety Impact

This valve is normally closed and is verified to be adequately seated by leak tests at least once every 18 months (both Appendix J and IWV leak rate tests). This valve performs the passive safety functions of containment isolation and reactor coolant system pressure isolation. Its active function of relieving pressure between valves RHR-V-8 and RHR-V-9 is a very unlikely situation and could only occur during time periods where both RHR-V-8 and 9 are shut and containment temperature is significantly above normal (i.e., LOCA condition). The proposed alternate testing avoids extraordinary testing efforts with inherent potential for violations of the WNP-2 Technical Specification.

This will provide adequate assurance of material quality and public safety.

4.6 Record of Valve Inservice Tests

Records and reports pertaining to Valve Inservice Testing will be maintained according to Article IWV-6000 of the Code.

SAMPLE

DATA SHEET

VALVE STROKE

Valve	Stroke				Measured By	Accepted By
	Measured Data		Acceptance Criteria			
	Open	Close	Open	Close		
LPCS-V-1						
LPCS-FCV-1						
LPCS-V-12						
LPCS-V-3			Opens	Closes		
LPCS-V-33/						
LPCS-V-34			Opens	Closes		

Reviewed by: ____________________ Date/Time: ____________________

Accepted by: ____________________ Date/Time: ____________________

RV-8

TABLE F

Valve	Code Class	Category	Function
RCC-V-5	2	A	Isolation valves for closed
RCC-V-104	2	A	Cooling water lines.
RCC-V-21	2	A	
RCC-V-26	2	A-C	
RCC-V-40	2	A	

REQUEST FOR RELIEF NO. RV-9

System	Control Rod Drive Hydraulic Control Unit (HCU)
Valve(s) ASME Classification Function	Valves affected by this relief request are identified in TABLE G.
Code Testing Requirement	Quarterly exercising (IWV-3411 and IWV-3521) Cold shutdown exercising (IWV-3412 and IWV-3522) Valve timing for scram valves, HCU-V-126 and HCU-V-127 (IWV-3413)
Bases for Relief	1. Technical Specifications require that control rods be tested for operability at least every seven days. Acceptable operation the control rod drive mechanisms during Technical Specifications required testing will constitute acceptable operation of the associated valves. 2. During cold shutdown, control rods will be fully inserted into the core. 3. Technical Specifications explicitly state the maximum insertion time for individual control rods and the average scram insertion time for groups of rods. Scram insertion times are measured for 10% of the control rods, on a rotating bases, every 120 days. Since control rod insertion times are very sensitive to scram valve actuation times, acceptable insertion time measurement results will constitute acceptable scram valve actuation times.
Alternate Testing to be Performed	1. Control Rod Drive Hydraulic Control Unit valves will be tested in accordance with plant Technical Specifications.

RV-9

Quality/Safety Impact

Both IWV and the Technical Specifications are intended to increase the safety and reliability of the plant. Since the ultimate purpose of the valves in Table G is to position the control rods, proper rod operation is sufficient assurance that these valves are operating properly. Since the intent of IWV is being met by Technical Specification requirements, granting this relief request will maintain acceptable quality and safety levels.

RV-9

TABLE G

Valve	Code Class	Category	Function
HCU-V-114	2	B-C	HCU discharge to scram header reverse flow check valve.
HCU-V-115	2	B-C	CRD charging water reverse flow-check valve.
HCU-V-117	2	B	Instrument air to scram valves.
HCU-V-118	2	B	
HCU-V-120	2	B	Control Rod Drive supply to rod drive mechanisms (normal operation).
HCU-V-121	2	B	
HCU-V-122	2	B	
HCU-V-123	2	B	
HCU-V-126	2	B	Control Rod Drive scram valves.
HCU-V-127	2	B	
HCU-V-137	2	B	Rod drive cooling water reverse flow check valve.
HCU-V-138	2	B	Control Rod Drive water reverse flow check valve.

REQUEST FOR RELIEF NO. RV-10

System	Reactor Recirculation Control
Valve(s) ASME Classification Function	Valves affected by this relief request are identified in TABLE H.
Code Testing Requirement	Quarterly exercising. (IWV-3411)
Basis for Relief	Exercising of the hydraulic valves may cause repositioning of the reactor recirculation flow control valve, causing undesirable reactivity changes in the core.
Alternate Testing to be Performed	Valves will be exercised during cold shutdown.

Quality/Safety Impact

The valves in Table H affect the reactor recirculation flow control valve position and, hence, significantly contribute to core reactivity control. During power operations, failure of these valves to re-open after exercising would adversely affect plant operation by reducing the reliability of the recirculation system. The proposed alternate testing contributes to acceptable levels of safety and quality by reducing the possibility of unnecessary reactivity control problems.

RV-10

TABLE H

Valve	Code Class	Category	Function
HY-V-17A	2	B	Valves provide hydraulic control fluid to the reactor recirculation flow control valves' hydraulic operators. Recirculation flow control valves are RRC-V-60A and RRC-V-60B.
HY-V-17B	2	B	
HY-V-18A	2	B	
HY-V-18B	2	B	
HY-V-19A	2	B	
HY-V-19B	2	B	
HY-V-20A	2	B	
HY-V-20B	2	B	
HY-V-33A	2	B	
HY-V-33B	2	B	
HY-V-34A	2	B	
HY-V-34B	2	B	
HY-V-35A	2	B	
HY-V-35B	2	B	
HY-V-36A	2	B	
HY-V-36B	2	B	

REQUEST FOR RELIEF NO. RV-11

System	Residual Heat Removal
Valve(s) ASME Classification Function	Valves affected by this request are identified in Table I.
Code Testing Requirement	Quarterly exercising (IWV-3411)
Basis for Relief	1. Valves are interlocked with reactor coolant system pressure such that valves automatically close to protect the RHR pump suction line from elevated reactor coolant system pressures. Opening circuit is disabled by the same pressure interlocks. 2. Over pressurization of the suction line may cause the loss of shutdown RHR cooling capability. 3. Interlocks cannot be bypassed with normal control circuits.
Alternate Testing to be Performed	Valves will be exercised during cold shutdowns.

Quality/Safety Impact

NRC guidance recognized the potential hazards associated with testing high pressure--low pressure interface valves. Specifically mentioned is the potential of subjecting low pressure piping to pressures above their design pressure, thus compromising the integrity of the plant. The proposed alternate testing is consistant with NRC guidance, reduces the possibility of adverse plant effects and assures acceptable levels of quality and safety.

RV-11

TABLE I

Valve	Code Class	Category	Function
RHR-V-8	1	A	Isolation valves in RHR shutdown cooling suction line from recirculation Loop A
RHR-V-9	1	A	
RHR-V-23	1	A	RHR supply to Vessel head spray
RHR-V-53A	1	A	Shutdown cooling return Loop A outboard isolation valve
RHR-V-53B	1	A	Shutdown cooling return Loop B outboard isolation valve

4.6 Listing of Category A Valves

ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWV defines a "Category A" valve as one "for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of its function". For this type of valve, individual leak rate test will be performed to determine leakage past the valve seat. Tests will be conducted in accordance with the requirements of 10CFR50, Appendix J, Section XI, or both, as indicated on the following table.

Listing of Category A Valves

Valve	Class	Leak Rate Testing Required: Appendix J.	Leak Rate Testing Required: Section XI	Valve Function
RCIC-V-8	1	X	X	Steam to RCIC Turbine
RCIC-V-13	1	X	X	RCIC injection (outboard)
RCIC-V-19	2	X		RCIC miniflow to Wetwell
RCIC-V-31	2	X		RCIC suction from Wetwell
RCIC-V-63	1	X	X	Steam from Rx to RHR Hx's & RCIC Turbine
RCIC-V-64	1	X	X	Steam to RHR Hx's
RCIC-V-66	1	X	X	Vessel head spray Ch.vv
RCIC-V-68	2	X		Turbine Exhaust to Wetwell
RCIC-V-69	2	X		Vacuum pump return to Wetwell
RCIC-V-76	1	X	X	RCIC-V-63 Bypass valve
RCIC-V-110	2	X		Turbine Exchange line vacuum breaker
RCIC-V-113	2	X		Turbine Exchange line vacuum breaker
LPCS-V-1	2	X		LPCS suction from Wetwell
LPCS-V-5	1	X	X	LPCS injection (outboard)
LPCS-V-6	1	X	X	LPCS injection (inboard)
LPCS-FCV-11	2	X		LPCS Miniflow valve
LPCS-V-12	2	X		Test line Iso. valve
HPCS-V-4	1	X	X	HPCS injection (outboard)
HPCS-V-5	1	X	X	HPCS injection (inboard)
HPCS-V-12	2	X		HPCS miniflow valve
HPCS-V-15	2	X		HPCS suction from Wetwell
HPCS-V-23	2	X		HPCS test return to Wetwell
RHR-V-4A	2	X		RHR suction from Wetwell
RHR-V-4B	2	X		RHR suction from Wetwell
RHR-V-4C	2	X		RHR suction from Wetwell
RHR-V-8	1	X	X	Shutdown cooling suction
RHR-V-9	1	X	X	Valves
RHR-V-11A	2	X		Condensed steam return from
RHR-V-11B	2	X		Hx's to Wetwell
RHR-V-16A	2	X		Drywell spray lines'
RHR-V-16B	2	X		isolation valves
RHR-V-17A	2	X		Drywell spray lines'
RHR-V-17B	2	X		isolation valves
RHR-V-21	2	X		Loop C test line return to Wetwell

Listing of Category A Valves

Valve	Class	Leak Rate Testing Required: Appendix J.	Leak Rate Testing Required: Section XI	Valve Function
RHR-V-23	1	X	X	RHR to head spray line
RHR-V-24A	2	X		Loop A test line return to Wetwell
RHR-V-24B	2	X		Loop B test line return to Wetwell
RHR-V-27A	2	X		RHR to suppression pool spray header
RHR-V-27B	2	X		RHR to suppression pool spray header
RHR-V-41A	1	X	X	RHR injection to reactor vessel
RHR-V-41B	1	X	X	RHR injection to reactor vessel
RHR-V-41C	1	X	X	RHR injection to reactor vessel
RHR-V-42A	1	X	X	RHR injection Iso. valve
RHR-V-42B	1	X	X	RHR injection Iso. valve
RHR-V-42C	1	X	X	RHR injection Iso. valve
RHR-V-50A	1	X	X	Shutdown cooling return
RHR-V-50B	1	X	X	check valves
RHR-V-53A	1	X	X	Shutdown cooling return
RHR-V-53B	1	X	X	isolation valves
RHR-FCV-64A	2	X		RHR pump miniflow valves
RHR-FCV-64B	2	X		RHR pump miniflow valves
RHR-FCV-64C	2	X		RHR pump miniflow valves
RHR-V-124A	2	X		RCIC steam to RHR Hx
RHR-V-124B	2	X		steam line drip pot
RHR-V-125A	2	X		drain valves
RHR-V-125B	2	X		
RHR-V-134A	2	X		H_2 recombiner scrubber
RHR-V-134B	2	X		drains to Wetwell
RHR-V-209	1	X	X	Pressure relief bypass around RHR-V-9
SLC-V-4A	1	X	X	SLC pump explosive-actuated
SLC-V-4B	1	X	X	discharge valve
SLC-V-6	1	X	X	SLC injection line isolation
SLC-V-7	1	X	X	valves

Listing of Category A Valves

Valve	Class	Leak Rate Testing Required: Appendix J.	Leak Rate Testing Required: Section XI	Valve Function
RWCU-V-1	1	X	X	Cleanup Water Pump suction line isolation valves
RWCU-V-4	1	X	X	
RWCU-V-40	1	X	X	RWCU discharge containment isolation valve
RCC-V-5	2	X		Closed cooling water supply to containment equipment isolation valves
RCC-V-21	2	X		
RCC-V-26	2	X		
RCC-V-40	2	X		
FPC-V-153	2	X		Suppression pool cleanup outlet and return line isolation valves
FPC-V-154	2	X		
FPC-V-156	2	X		
MS-V-16	1	X	X	Main steam line drain isolation valves
MS-V-19	1	X	X	
MS-V-22A	1	X	X	Main steam lines' inboard isolation valves
MS-V-22B	1	X	X	
MS-V-22C	1	X	X	
MS-V-22D	1	X	X	
MS-V-28A	1	X	X	Main steam lines' outboard isolation valve
MS-V-28B	1	X	X	
MS-V-28C	1	X	X	
MS-V-28D	1	X	X	
MS-V-37 Series	3		X	S/RV discharge downcomer vacuum breakers.
MS-V-38 Series	3		X	
MS-V-67A	1	X	X	Main steam line drains (outside containment)
MS-V-67B	1	X	X	
MS-V-67C	1	X	X	
MS-V-67D	1	X	X	
RFW-V-10A	1	X	X	Feedwater line isolation valves
RFW-V-10B	1	X	X	
RFW-V-32A	1	X	X	
RFW-V-32B	1	X	X	
RFW-V-65A	1	X	X	
RFW-V-65B	1	X	X	

Listing of Category A Valves

Valve	Class	Leak Rate Testing Required: Appendix J.	Leak Rate Testing Required: Section XI	Valve Function
EDR-V-19	2	X		Drywell equipment drain sump discharge line isolation valves
EDR-V-20	2	X		
FDS-V-3	2	X		Floor drain sump discharge line isolation valves
FDR-V-4	2	X		
CEP-V-1B	2	X		Containment purge exhaust isolation valves
CEP-V-2B	2	X		
CEP-V-3B	2	X		
CEP-V-4B	2	X		
CSP-V-5	2	X		Containment purge supply isolation valves
CSP-V-6	2	X		
CSP-V-7	2	X		
CSP-V-8	2	X		
CSP-V-9	2	X		
CSP-V-10	2	X		
CVB-V-1A through CVB-V-1T	2		X	Vacuum breakers for drywell-wetwell down comers.
CAC-V-2	2	X		H_2 recombiner inlet/exhaust stop valves
CAC-V-4	2	X		
CAC-V-6	2	X		
CAC-V-8	2	X		
CAC-V-11	2	X		
CAC-V-13	2	X		
CAC-V-15	2	X		
CAC-V-17	2	X		
CAC-FCV-1A	2	X		H_2 recombiner inlet/exhaust throttle valves
CAC-FCV-1B	2	X		
CAC-FCV-2A	2	X		
CAC-FCV-2B	2	X		
CAC-FCV-3A	2	X		
CAC-FCV-3B	2	X		
CAC-FCV-4A	2	X		
CAC-FCV-4B	2	X		

Listing of Category A Valves

Valve	Class	Leak Rate Testing Required: Appendix J.	Leak Rate Testing Required: Section XI	Valve Function
CIA-V-20	2	X		Containment instrument air outboard Iso. valve
CIA-V-21	2	X		Containment instrument air inboard Iso. valve
CIA-V-24	2	X		Inboard MSIV Instrument air supply check valve
CIA-V-30A	2	X		Backup N_2 supply to containment Iso. valves (outboard)
CIA-V-30B	2	X		
CIA-V-31A	2	X		Backup N_2 supply to ADS valves (inboard Iso. valve)
CIA-V-31B	2	X		
CIA-V-36 (series)	2	X		Main steam safety/relief valve instrument air supply check valve
CIA-V-40 (series)	2		X	N_2 supply to ADS valves
MSLC-V-2A	1	X	X	MSLC line isolation valve (first off)
MSLC-V-2B	1	X	X	
MSLC-V-2C	1	X	X	
MSLC-V-2D	1	X	X	
MSLC-V-3A	1	X	X	MSLC line isolation valve (second off)
MSLC-V-3B	1	X	X	
MSLC-V-3C	1	X	X	
MSLC-V-3D	1	X	X	

4.7 Record of Valve Inservice Tests

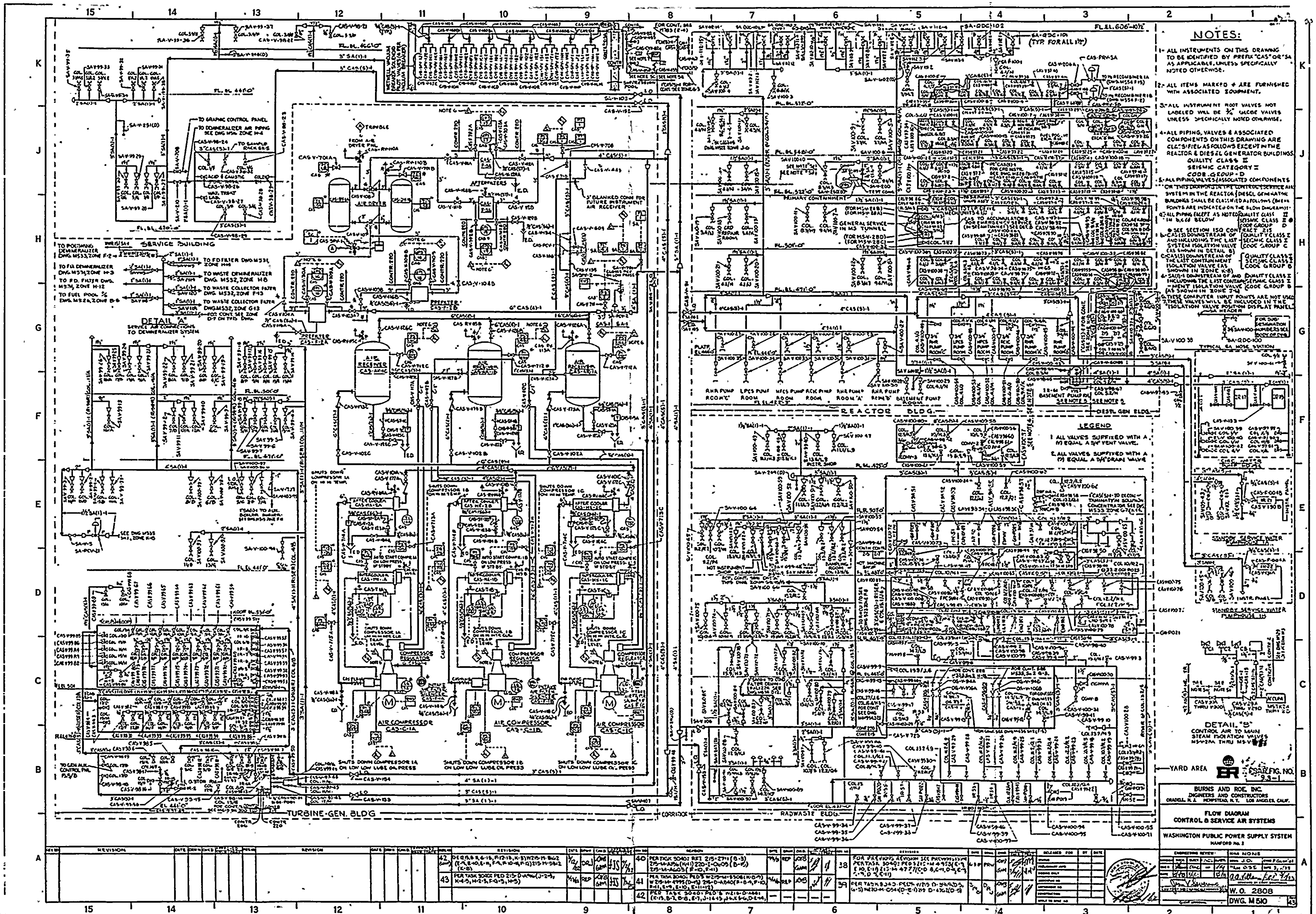
Records and reports pertaining to Valve Inservice Testing will be maintained according to Article IWV-6000 of the Code.

5.0 Quality Assurance Program

The WNP-2 Pump and Valve Inservice Test Program activities will be conducted in accordance with Topical Report WPPSS-QA-004, the Supply System's Operational Quality Assurance Program description.

6.0 Flow Diagrams

The Flow Diagrams used to generate this Program are included for user reference. Due to the time required for Program publication, an administrative cut-off date of November 2, 1983 was chosen to "freeze" drawing revisions used for Revision 2 of the Program. All subsequent changes to system design shall be evaluated for impact on the PVT Program Plan and new revisions to this Program shall be issued accordingly.



NOTES:
1- ALL INSTRUMENTS ON THIS DRAWING TO BE IDENTIFIED BY PREFIX "CAS" OR "SA" AS APPLICABLE, UNLESS SPECIFICALLY NOTED OTHERWISE.
2- ALL ITEMS MARKED ◆ ARE FURNISHED WITH ASSOCIATED EQUIPMENT.
3- ALL INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
4- ALL PIPING, VALVES & ASSOCIATED COMPONENTS ON THIS DRAWING ARE CLASSIFIED AS FOLLOWS EXCEPT IN THE REACTOR & DIESEL GENERATOR BUILDINGS.
QUALITY CLASS II
SEISMIC CATEGORY II
CODE GROUP - D
5- ALL PIPING, VALVES & ASSOCIATED COMPONENTS OF THIS DRAWING IN THE CONTROL & SERVICE AIR SYSTEM IN THE REACTOR & DIESEL GENERATOR BUILDINGS SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON THE FLOW DIAGRAM):
a- ALL PIPING EXCEPT AS NOTED IN b, c & d BELOW: QUALITY CLASS II, SEISMIC CLASS II ●, CODE GROUP D
● SEE SECTION 150 CONTRACT 215
b- CAS(5) DOWNSTREAM OF AND INCLUDING THE LAST SYSTEM ISOLATION VALVE (AS SHOWN IN DETAIL B): QUALITY CLASS I, SEISMIC CLASS I, CODE GROUP C
c- CAS(5) DOWNSTREAM OF THE LAST CONTAINMENT ISOLATION VALVE (AS SHOWN IN ZONE K-8): QUALITY CLASS I, SEISMIC CLASS I, CODE GROUP B
d- SA(1)-1 DOWNSTREAM OF AND INCLUDING THE LAST CONTAINMENT ISOLATION VALVE (AS SHOWN IN ZONE J-4): QUALITY CLASS I, SEISMIC CLASS I, CODE GROUP B
6. THESE COMPUTER INPUT POINTS ARE NOT USED
7. THESE VALVES WILL BE INCLUDED IN THE "ISOLATION VALVE POSITION DISPLAY PANEL"
TYPICAL SA HOSE STATION
LEGEND
1. ALL VALVES SUFFIXED WITH A (V) EQUAL A 3/4" VENT VALVE.
2. ALL VALVES SUFFIXED WITH A (D) EQUAL A 3/4" DRAIN VALVE
DETAIL "A"
SERVICE AIR CONNECTIONS TO DEMINERALIZER SYSTEM
DETAIL "B"
CONTROL AIR TO MAIN STEAM ISOLATION VALVES MS-V-22A THRU MS-V-28D
SERVICE BUILDING
TURBINE-GEN. BLDG
REACTOR BLDG.
RADWASTE BLDG.
DIESEL GEN BLDG.
YARD AREA
STANDBY SERVICE WATER PUMPHOUSE 1A
STANDBY SERVICE WATER PUMPHOUSE 1B
AIR COMPRESSOR CAS-C-1A
AIR COMPRESSOR CAS-C-1B
AIR COMPRESSOR CAS-C-1C
AIR RECEIVER
AIR DRYER
AFTERFILTERS
PREFILTER
FSAR FIG. NO. 9.3-1
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N.J. HEMPSTEAD, N.Y. LOS ANGELES, CALIF.
FLOW DIAGRAM
CONTROL & SERVICE AIR SYSTEMS
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD No. 2
SCALE NONE
W.O. 2808
DWG. M510