50-397 WPPSS II

Submitted Re Req 1 To Pump & Valve Inservice Test Program Ltr Dtd. 10/7/82

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 2

PUMP AND VALVE INSERVICE TEST PROGRAM PLAN

PUMP AND VALVE INSERVICE TEST

PROGRAM PLAN

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NUCLEAR PROJECT NO. 2

Prepared by	Operations Support Engineering	Date
Approved by	Supervisor, Generation Engineering	4/28/81 Date
Approved by	Deputy Project Manager, Engineering	5/15/81 Date
Approved by	Manager, Engineering Division	5/13/81 Date
Reviewed by	Technical ~~Supervisor~~ SUPERINTENDENT, WNP-2	8/3/81 Date
Approved by	Plant Manager, WNP-2	Date
Reviewed by	~~Operational~~ Manager, Quality Assurance ~~Division~~	9/9/81 Date
Reviewed by	Authorized Nuclear Inspector	9/9/81 Date

RECORD OF PROGRAM PLAN REVISIONS

No.	DATE	REVISIONS		BY	CHK'D	APP'D
0	4/3/81	ORIGINAL		MPR	F. Frisch	D.W. Foster

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

TITLE	SHEET	DATE/REV.	TITLE	SHEET	DATE/REV.
4.0 WNP-2	4-6	0	4.0 WNP-2	4-26	0
Valve Inservice	4-7	0	Valve Inservice	4-27	0
Test Program	4-8	0	Test Program	4-28	0
(Contd)	4-9	0	(Contd)	4-29	0
	4-10	0		4-30	0
	4-11	0		4-31	0
	4-12	0		4-32	0
	4-13	0		4-33	0
	4-14	0		4-34	0
	4-15	0		4-35	0
	4-16	0		4-36	0
	4-17	0		4-37	0
	4-18	0		4-38	0
	4-19	0		4-39	0
	4-20	0		4-40	0
	4-21	0		4-41	0
	4-22	0		4-42	0
	4-23	0		4-43	0
	4-24	0		4-44	0
	4-25	0		4-45	0

TITLE	SHEET	DATE/REV.	TITLE	SHEET	DATE/REV.
4.0 WNP-2	4-46	0	4.0 WNP-2	4-66	0
Valve Inservice	4-47	0	Valve Inservice	4-67	0
Test Program	4-48	0	Test Program	4-68	0
(Contd)	4-49	0	(Contd)	4-69	0
	4-50	0		4-70	0
	4-51	0		4-71	0
	4-52	0		4-72	0
	4-53	0		4-73	0
	4-54	0		4-74	0
	4-55	0		4-75	0
	4-56	0		4-76	0
	4-57	0		4-77	0
	4-58	0			
	4-59	0			
	4-60	0			
	4-61	0			
	4-62	0			
	4-63	0			
	4-64	0			
	4-65	0			

1.0 INTRODUCTION

This Pump and Valve Inservice Test Program Plan is applicable to tne 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. Tne 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 tne ASME Boiler and Pressure Vessel Code, 1977 Edition with Addenda through Summer 1978. 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 was prepared in accordance with this Code Edition and Addenda.

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 grade 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 [3] and guidelines.[4]

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.

A major feature of the WNP-2 Pump Inservice Test Program is that it requires quarterly rather than monthly inservice testing. This stipulation is based on the most recent ASME requirements for pump testing.[2] As detailed in Relief Request RP-1, this requirement equals the Technical Specification mandates for most safeguards pumps and exceeds Technical Specifications requirements for others.

The water leg ("Keep full") pumps, though technically within the scope of the approved code,[1] are excluded from the Test Table since they serve no specific function in shutting down the reactor or in mitigating the consequences of an accident. This is also consistent with the requirements of the latest Code Edition.[2]

The Supply System is confident that the WNP-2 Pump Inservice Test Program complies with the intent of the approved Codes,[1] regulations[3] and guidelines[4] and contributes to ensuring the safety of the general public.

---

1. ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWP, (1977 Edition with Addenda through Summer, 1978).

2. 1980 Edition of the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWP.

3. 10CFR 50:55 a(g).

4. 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 safeguard 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 grade pumps and will be implemented as part of the normal surveillance routine.

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 up 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 (portable temperature or vibration monitors) will be noted. Instrument identification numbers, range and calibration verification of additional instrumentation will be recorded in the procedure.

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 normal reactor operating pressures. The pump can take suction from the Condensate Storage Tank or from the Wetwell.

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 normally takes suction from the suppression pool.

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 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 safeguard 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, 1C

These pumps transfer diesel generator fuel oil from the subterranean storage tanks to the diesel's Day Tanks. Pump 1C 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.

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

Pump Ident.	ASME Code Class	IWP Parameter: 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	A	NR	Q	1,4
HPCS-P-2	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,4,5
LPCS-P-1	2	Q	Q	Q	Q	Q	A	NR	Q	1,4
RHR-P-2A	2	Q	Q	Q	Q	Q	A	NR	Q	1,4
RHR-P-2B	2	Q	Q	Q	Q	Q	A	NR	Q	1,4
RHR-P-2C	2	Q	Q	Q	Q	Q	A	NR	Q	1,4
SLC-P-1A	2	N/A	Q	N/A	Q	Q	A	NR	Q	1,2
SLC-P-1B	2	N/A	Q	N/A	Q	Q	A	NR	Q	1,2
SW-P-1A	3	N/A	Q	N/A	Q	Q	A	NR	Q	1,4,5
SW-P-1B	3	N/A	Q	N/A	Q	Q	A	NR	Q	1,4,5
RCIC-P-1	2	Q	Q	Q	Q	Q	A	Q	Q	1
DO-P-1A	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,3,4
DO-P-1B	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,3,4
DO-P-1C	3	N/A	Q	N/A	Q	Q	N/A	NR	Q	1,3,4

Legend

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

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

Pumps(s)

All IWP Program Pumps.

Section XI Code Requirement
for which Relief is Requested

Monthly inservice testing.

Bases for Request

1. The ASME Code, Section XI currently recognizes quarterly inservice testing as sufficient to assure plant safety and reliability since the hydraulic and mechanical parameters of standby pumps generally do not change significantly over a three month period. (Reference: 1980 Edition of the ASME Boiler and Pressure Vessel Code.) Any concerns regarding proper system hydraulic and electrical alignment can be resolved by alternate testing (see below).

2. The proposed Pump Test Program equals or exceeds the WNP-2 Technical Specifications which currently specify:

   c) Quarterly flow tests for:

HPCS-P-1	RCIC-P-1	RHR-P-2A
HPCS-P-2	LPCS-P-1	RHR-P-2B
		RHR-P-2C

   b) Semi-annual flow tests for SW-P-1A and SW-P-1B.

   c) No flow testing of DO-P-1A, DO-P-1B or DO-P-1C.

3. Technical Specifications require monthly surveillance to verify system alignment.

Alternate Testing Proposed

1. Complete inservice tests will be performed quarterly in accordance with the requirements of ASME Section XI, Subsection IWP.

2. Monthly surveillance tests will continue to be performed to verify proper alignment of system hydraulic and electrical components.

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 test procedures 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.

RELIEF REQUEST RP-3

Pump(s)

DO-P-1A (Diesel Fuel Oil Transfer Pumps)
DO-P-1B
DO-P-1C

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. Code interpretations consider these pumps to be outside this scope of the ASME Boiler and Pressure Vessel Codes. Hence all testing done on these pumps is strictly voluntary. See attached letter, page 3-11a.

2. The transfer pumps are vertical turbine type pumps and, as such, are submerged in the fuel oil. There is no suction line which can be instrumented.

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

Alternate Testing Proposed

1. Storage tank levels will be recorded as part of the transfer pump tests. Storage tank level requirements will be stated in the Technical Specifications.

2. Pump discharge pressure and flowrate will be measured during the test.

The American Society of Mechanical Engineers
United Engineering Center / 345 E. 47th St., New York, N.Y. 10017 / 212-644-7815

February 16, 1978

Copy: K. H. Hannah
L. T. Harrold
T. C. Mowery
W. D. Baimard
O. E. Tropp
D. C. Timmons
B. K. McLeod
O. K. Gade
W. G. Conn
N. S. Porter
J. E. Werle
D. W. Porter/orig.

L. T. Harrold, Supervisor, ISI Programs
Washington Public Power Supply System
PO Box 968
3000 George Washington Way
Richland, WA 99352

Subject: Section XI, Division 1, IWA-1100
Scope of Section XI, Division 1

Reference: Your letter of September 19, 1977 (APO 77-59)
ASME File #: BC 77-666
NI 77-371

Dear Mr. Harrold:

Your inquiry and our response are as stated below:

QUESTION:

Is it the intent of Subarticle IWA-1100 that the rules and requirements of Section XI, Division 1 for inservice inspection of Class 1, 2 & 3 pressure retaining components (and their supports) be applied only to water and steam systems in light water cooled nuclear power plants?

REPLY:

Systems containing other than steam or water were not originally considered by the Committee in formulating the rules in Section XI; they may, however, be included for further consideration and for revisions to future editions of Section XI. The requirements shown in Section XI, Article IWA-1000 on Scope and Responsibility, specifically Paragraph IWA-1400, requires the Owner of the nuclear plant to determine the appropriate Code, Class or Classes for each component of the nuclear power plant to be examined according to Section XI rules.

Very truly yours,

Kenneth I. Baron

Kenneth I. Baron,
Assistant Secretary

/fs

RELIEF REQUEST RP-4

Pump(s)

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

Section XI Code Requirement for which Relief is Requested

Measure bearing temperature, lubricant level and pressure, and vibration. (IWP-3100)

Bases for Request

1. Pumps are vertical turbine ("deep well") type pumps and are immersed in the fluid being pumped. This precludes measuring pump bearing vibration.

2. The pump bearings are lubricated and cooled by the pumped fluids.

3. Motors for DO-P-1A, 1B and 1C and HPCS-P-2 are not instrumented for temperature indication. Bearings are not accessible from the outside of the motor; consequently, portable temperature instrumentation readings would be meaningless.

Alternate Testing Proposed

1. Axial and radial vibration measurement will be taken at the outboard (upper) bearing of the pump's motor in accordance with IWP-4510 and IWP-1200. Radial vibration measurements will also be taken on motor housing as close as practical to the coupling.

2. For the RHR, SW, LPCS pumps and HPCS-P-1, motor bearing temperatures will be recorded and evaluated in accordance with IWP-1200.

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)

Base 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 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.

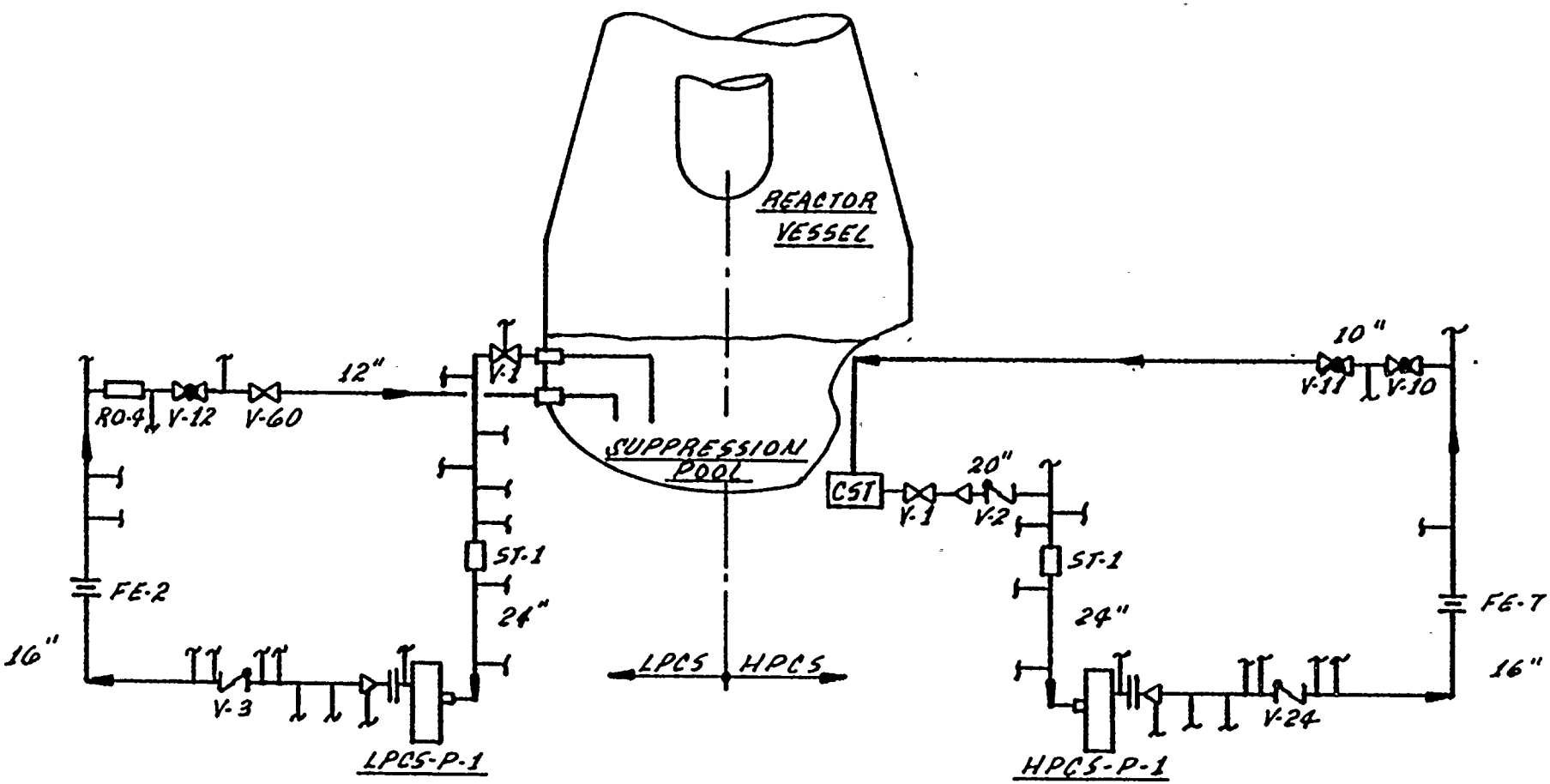
(4) Acceptable flowrate and discharge pressure will suffice as proof of adequate suction pressure.

Alternate Testing Proposed

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

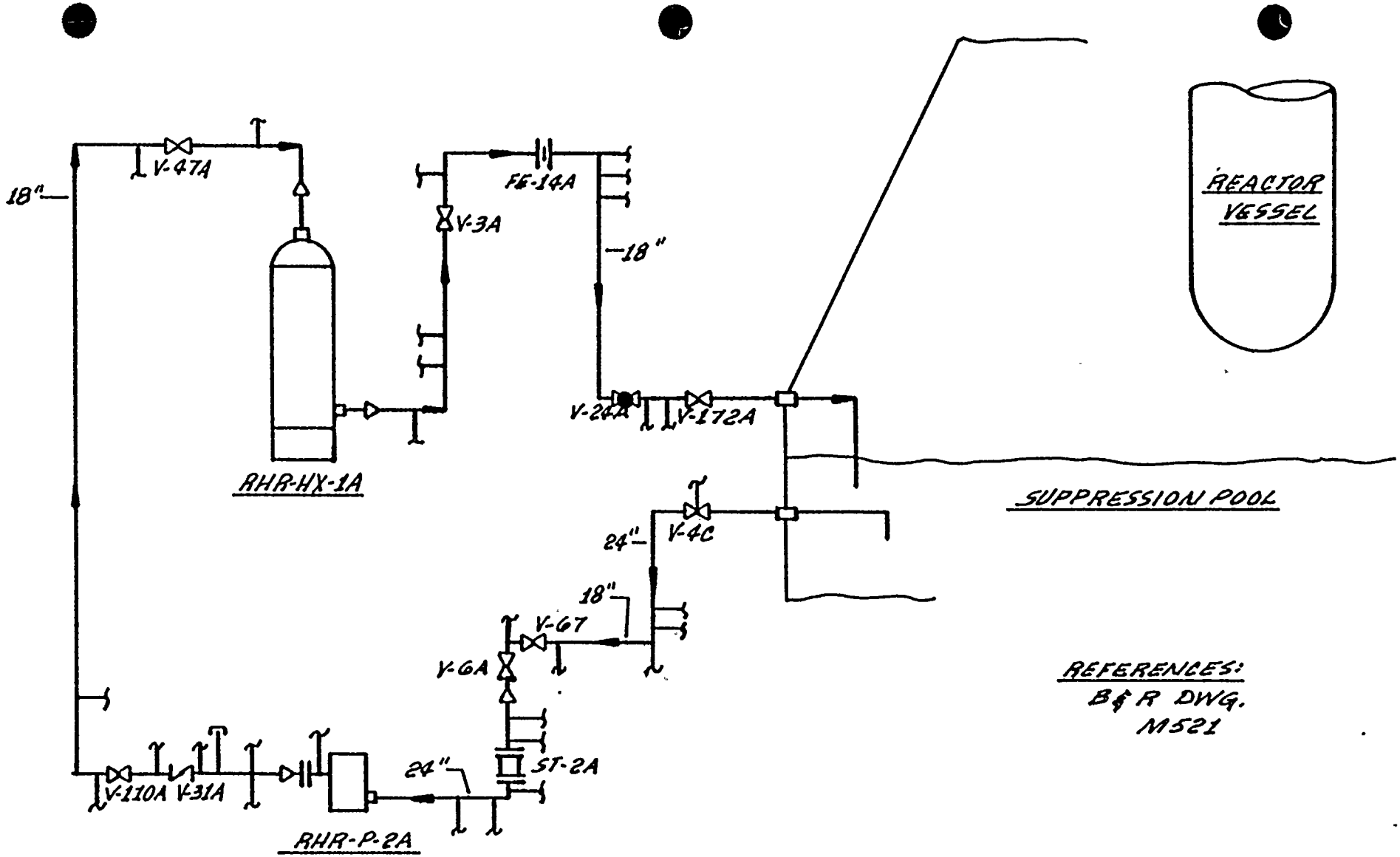
3.7 Proposed Pump Test Flow Paths

These flow paths will be used 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.



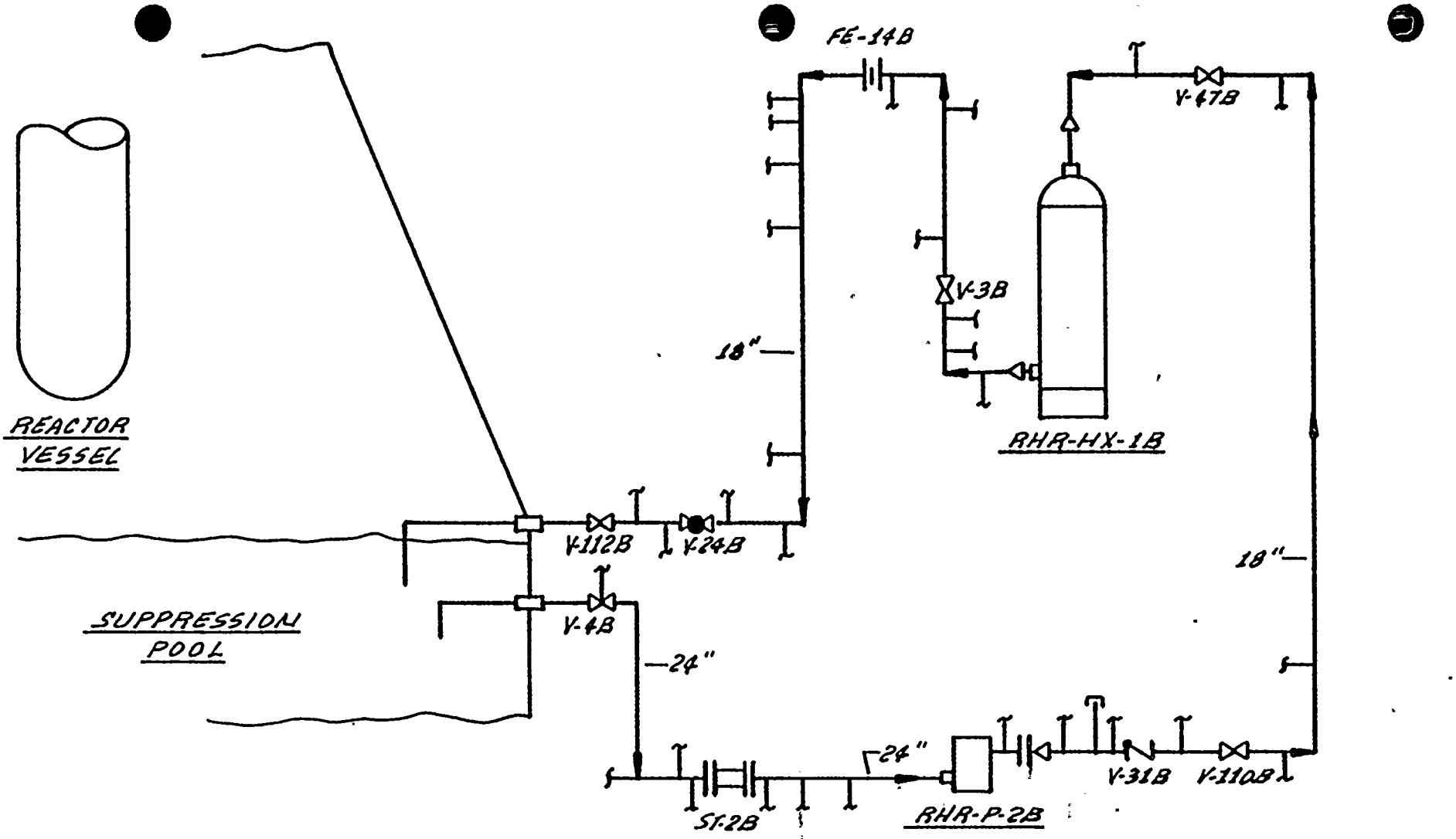
REFERENCE:
B & R DWG.
M520

HIGH PRESSURE CORE SPRAY
LOW PRESSURE CORE SPRAY



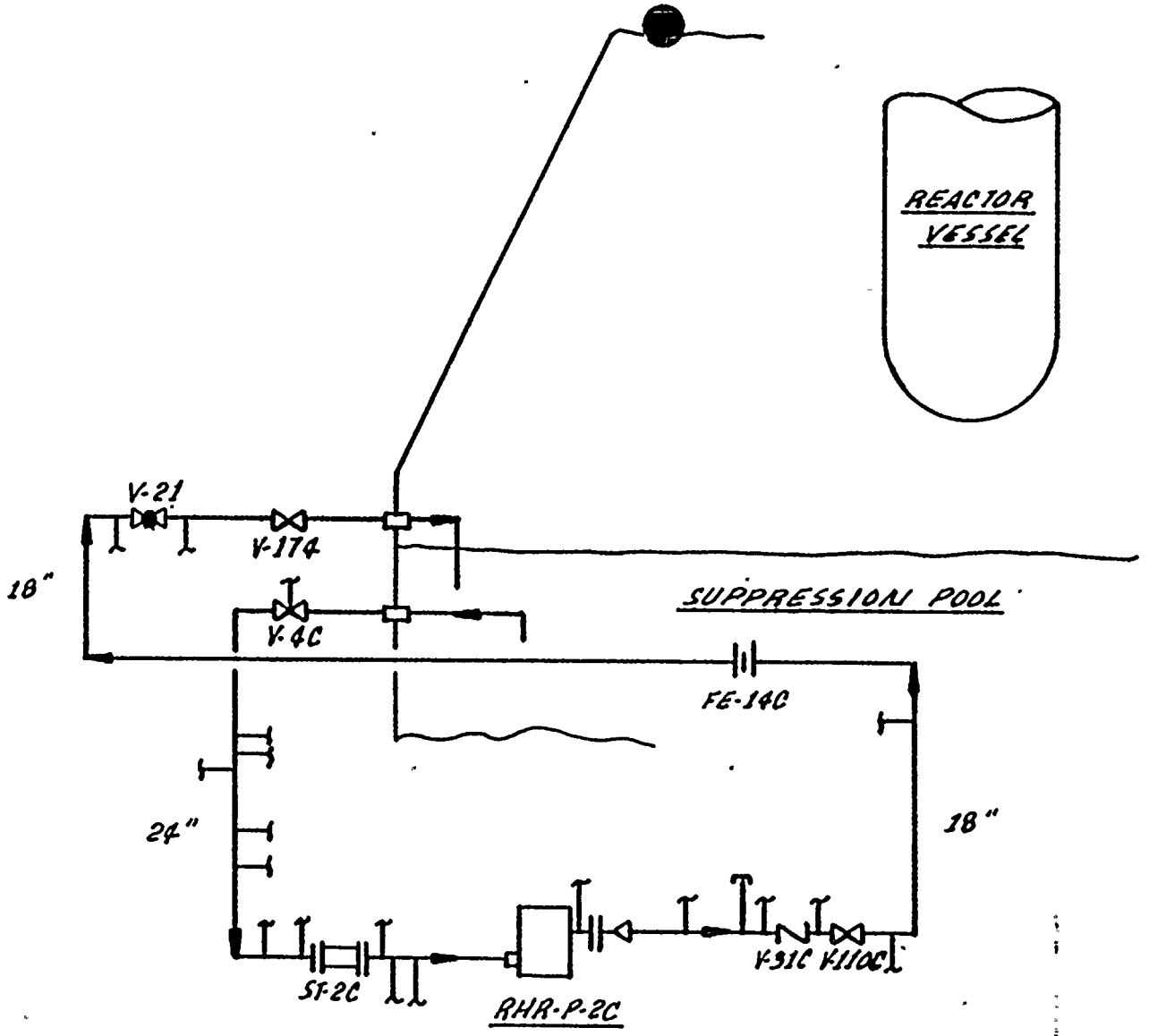
REFERENCES:
B & R DWG.
M521

RESIDUAL HEAT REMOVAL



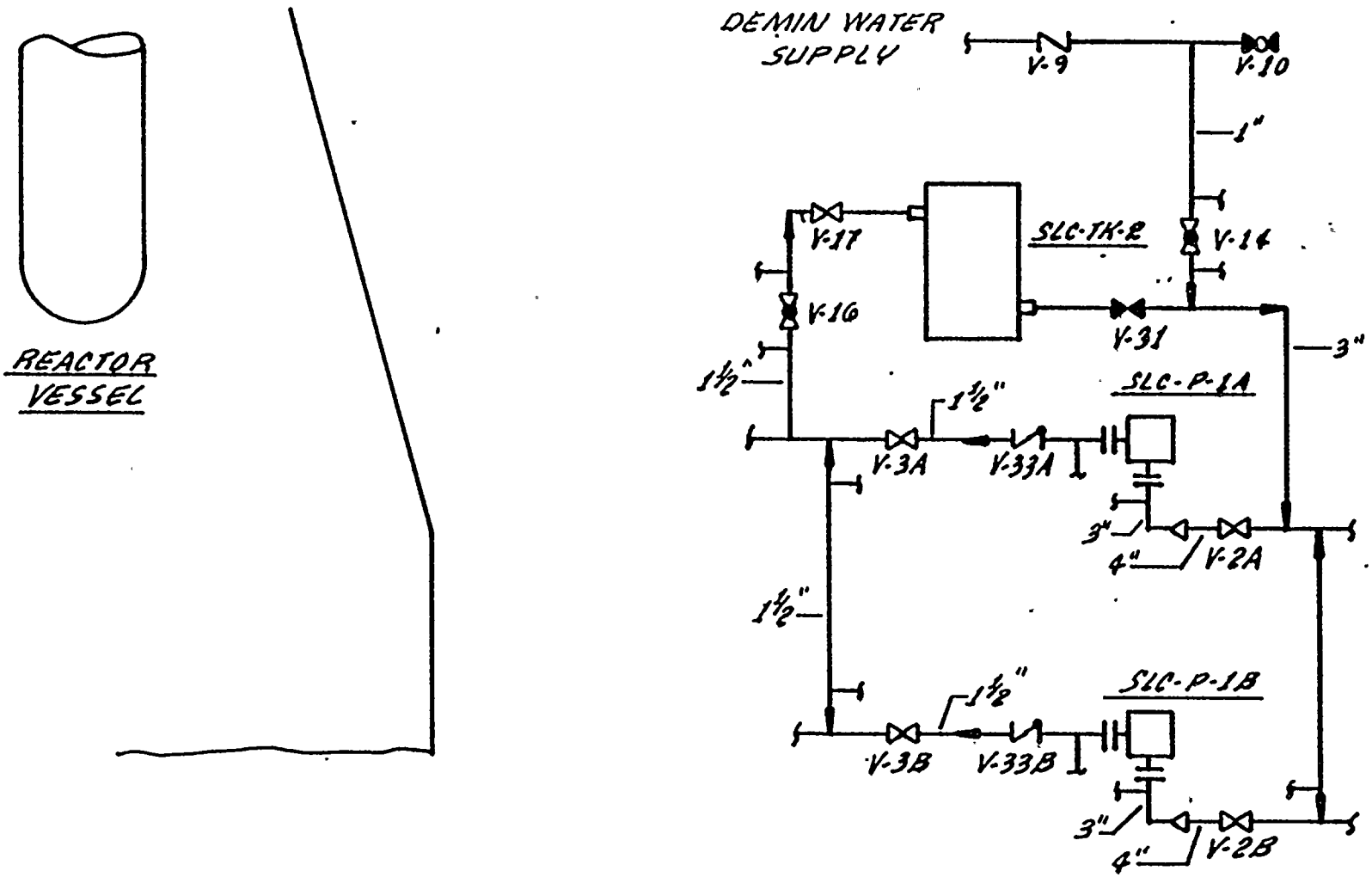
REFERENCES:
B & R DWG.
M521

RESIDUAL HEAT REMOVAL



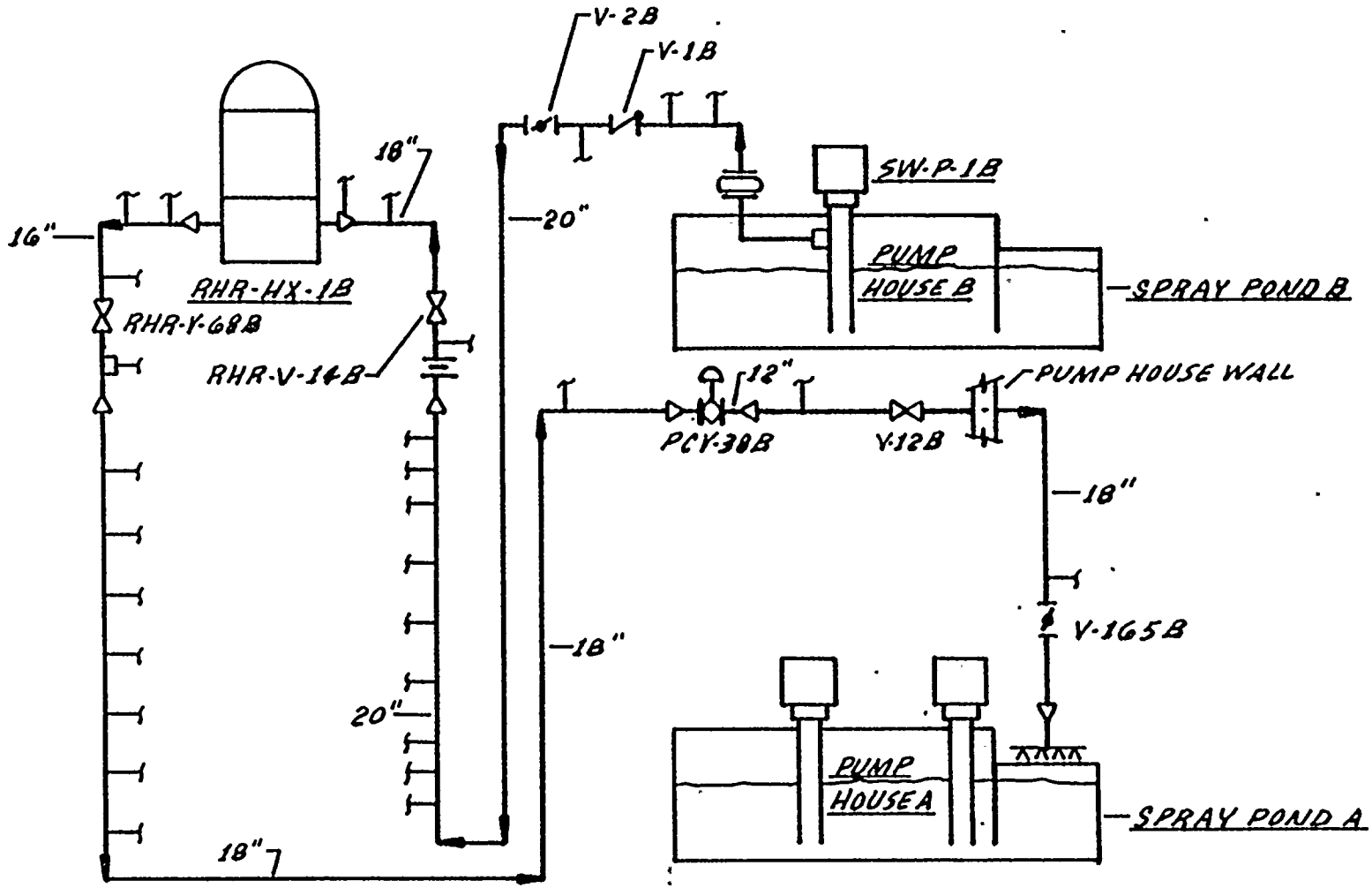
REFERENCE:
B & R DWG
M521

RESIDUAL HEAT REMOVAL



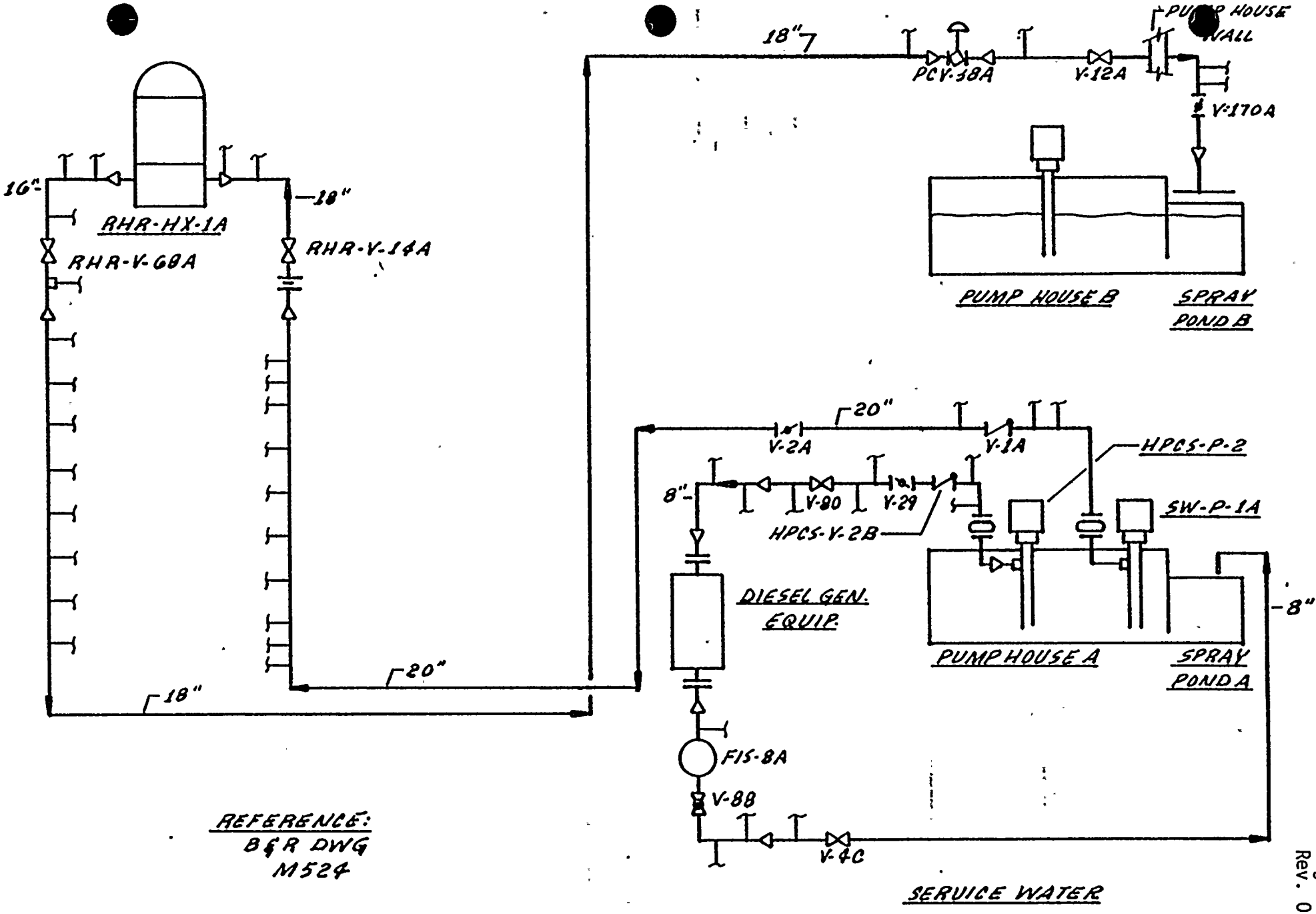
REFERENCE:
B&R DWG.
M522

STANDBY LIQUID CONTROL

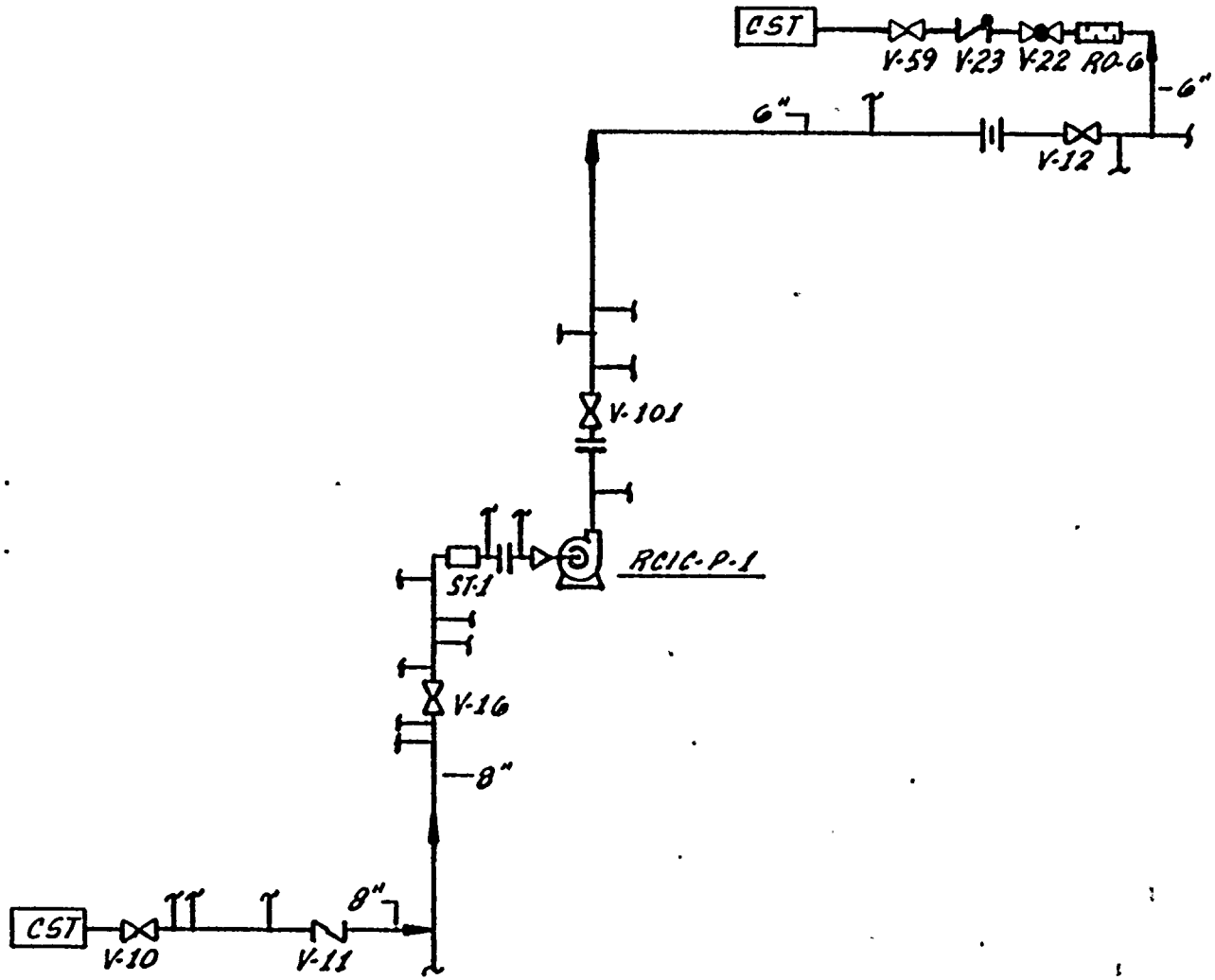


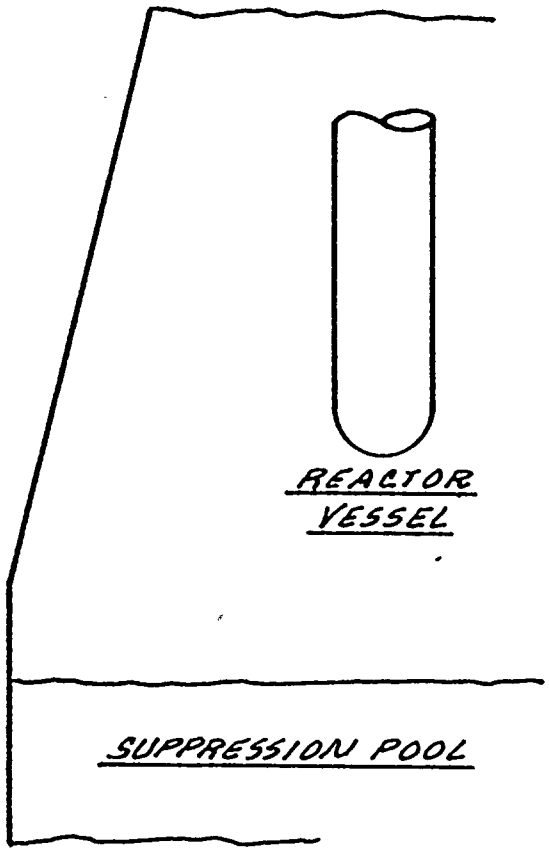
REFERENCE:
B & R DWG
M524

SERVICE WATER



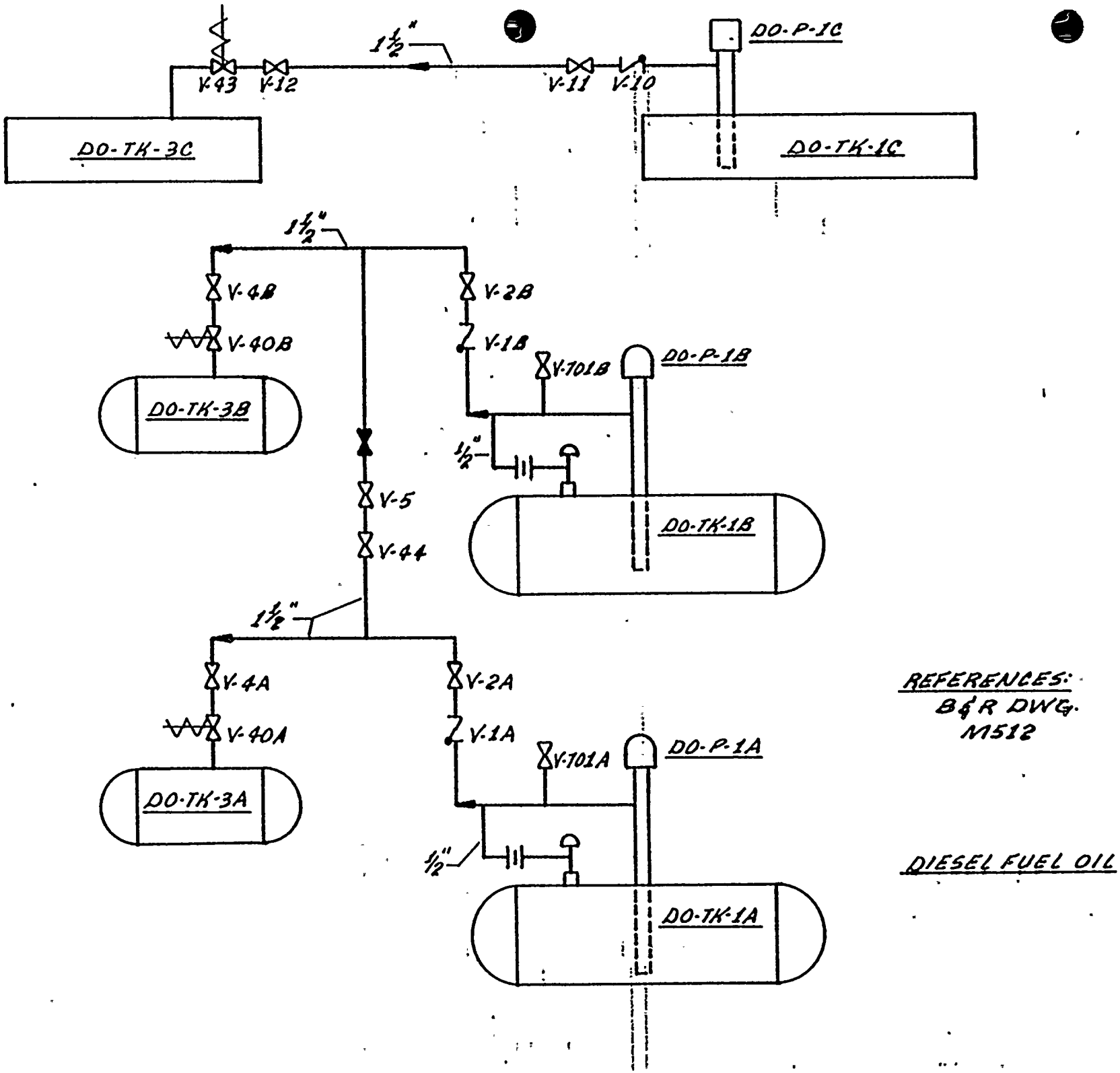
REFERENCE:
B&R DWG
M524





REFERENCES:
B & R DWG
M519

REACTOR CORE
ISOLATION COOLING



REFERENCES:
B&R DWG.
M512

DIESEL FUEL OIL

3.8 Reporting of Results

Records of Pump Inservice Test results will be in accordance with the intent of Article IWP-6000 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) Reference data as required by IWP-3100.

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

4) Summaries of corrective action.

The Pump Inservice Test Program, associated surveillance test procedures and results will be kept at the WNP-2 plant site. They will be available for audit by Authorized Nuclear Inspector and NRC Region V Inspectors. 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	(PI)			psi	
Pump Discharge Press	(PI)			psi	
System Flow	(FI)			gpm	
Discharge Pressure -		psig	psig	psig	
Suction Pressure -		psig	psig	psig	
Calculated RHR Pump ΔP		psid	psid	psid	
Pump Bearing Vibration	A	mil	mil	mil	
	B	mil	mil	mil	
(Include sketch of vibration	C	mil	mil	mil	
measurement location)	D	mil	mil	mil	
	E	mil	mil	mil	
	F	mil	mil	mil	
Pump Upper Bearing Temperature **		°F	°F	°F	
Pump Lower Bearing Temperature **		°F	°F	°F	

* If deviations fall within the ALERT RANGE, the test frequency is increased to once each 15 days. If deviations fall within the ACTION RANGE, the pump shall be declared inoperable and the deviation investigated and/or corrected.

** Pump bearing temperatures are required annually. Take readings 10 minutes apart until three readings do not vary by more than 3%, then record on data sheet. The ALERT/ACTION bearing temperatures are based on a pump suction temperature of approximately 75°F. IF ALERT or ACTION temperatures are exceeded, record suction temperatures in Comment Section.

COMMENTS: _____

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 Code Commitments[1] 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 or 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.

To generate the WNP-2 Program, all ASME Class 1, 2 and 3 valves were analyzed to determine their required type and frequency of testing. 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 single, united Leak Rate Testing Program.

The WNP-2 FSAR commits to meeting the requirements of both 10 CFR 50, Appendix J, 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

---

(1) ASME Boiler and Pressure Vessel Code, 1977 Edition with Addenda through Summer, 1978.

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

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 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 will satisfy Section XI leak rate testing in many instances. However, some valves may require both Appendix J and Section XI testing. Section 4.6 identifies valves which are subject to leak rate testing under the scope of Section XI, Sub-section IWV. Relief valves are not required to be leak rate tested (IWV-3512) subsequent to bench testing and are not included in Section 4.6. Nor are normally closed, manually operated containment isolation valves included. For implementation purposes, the test frequencies mandated in Appendix J, Section XI and the Tech Specs are the same. Leak rate testing will, in general, be performed during outages although some penetrations 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.

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,(3) and guidelines(4) and that it will make a positive contribution to the safe operation of the plant.

---

(3) 10CFR 50:55 a(g)(2)

(4) 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. 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 (see Section 4.5 - General Relief Request). 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 actuating power. In most cases this can be accomplished using normal control circuits.

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) 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.

(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
	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) Test — 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

(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 Rev 34 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
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	NA		

System Name DIESEL OIL AND MISC. (DO) Dwg. No. M 512 Rev 13A 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
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-1C	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		

System Name REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) Dwg. No. M 519 Rev 21 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
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/T	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 50 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 Rev. 21 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
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	CSO	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-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 Rev 18 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 Rev 18 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	CSD	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 Rev 25 Page 1 of 6

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 Rev. 25 Page 2 of 6

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	( )		

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521 Rev. 25 Page 3 of 6

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	ALL	S/E	N/A		2
RHR-V-50B	1	G8	X		X		12	CK	AO	C	ALL	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 Rev. 25 Page 4 of 6

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 Rev. 25 Page 5 of 6

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-123A	1	G10	X				1	GT	MO	C	ALL	S/T	( )	COORDINATE TEST	
RHR-V-123B	1	G6	X				1	GT	MO	C	ALL	S/T	( )	W/RHR-V-50A, B	
RHR-V-124A	2	D14	X				1-1/2	GT	MO	C	ALL	S/T	( )		
RHR-V-124B	2	D14	X				1-1/2	GT	MO	C	ALL	S/T	( )		
RHR-V-125A	2	D4	X				1-1/2	GT	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	GT	MO	C	ALL	S/T	( )		
RHR-V-134B	2	F2	X				2	GT	MO	C	ALL	S/T	( )		

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521 Rev. 25 Page 6 of 6

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-182	2	J6	X					SV	SOL	O	ALL	S/E	N/A		1
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			1 x 2	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		
RHR-RV-98	1	F9		X			3/4 x 1	RV	SA	C	REFUEL	BENCH TEST	N/A		

System Name STANDBY LIQUID CONTROL (SLC) Dwg. No. M522 Rev. 9 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 Rev. 32 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	O	ALL	S/T	( )		
RWCU-V-4	1	E15	X				6	GT	MO	O	ALL	S/T	( )		
RWCU-V-40	1	H11		X			6	GT	MO	O	ALL	S/T	( )		

System Name STANDBY SERVICE WATER (SW) Dwg. No. M524 Rev. 22 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
SW-V-1A	3	J5		X	X		20	CK	SA	C	ALL	S/E	N/A		
SW-V-1B	3	G5		X	X		20	CK	SA	C	ALL	S/E	N/A		
SW-V-2A	3	J5		X			20	BF	MO	C	ALL	S/T	( )		
SW-V-2B	3	G5		X			20	BF	MO	C	ALL	S/T	( )		
SW-V-4A	3	F8		X			8	GT	MO	O	ALL	S/T	( )		
SW-V-4B	3	C8		X			8	GT	MO	O	ALL	S/T	( )		
SW-V-4C	3	H8		X			8	GT	MO	O	ALL	S/T	( )		
SW-V-12A	3	J3		X			18	GT	MO	C	ALL	S/T	( )		
SW-V-12B	3	F3		X			18	GT	MO	C	ALL	S/T	( )		
SW-V-24A	3	D12		X			2	GT	MO	O	ALL	S/T	( )		
SW-V-24B	3	D10		X			2	GT	MO	O	ALL	S/T	( )		
SW-V-24C	3	D13		X			2	GT	MO	O	ALL	S/T	( )		
SW-V-29	3	J6		X			8	BF	MO	C	ALL	S/T	( )		
SW-V-34	3	D11		X			1 1/2	GB	SV	O	ALL	S/T	( )		
SW-V-44	3	D9		X			2	GT	MO	O	ALL	S/T	( )		
SW-V-54	3	D9		X			2	GT	MO	C	ALL	S/T	( )		

System Name STANDBY SERVICE WATER (SW) Dwg. No. M524 Rev. 20/M607 Rev. 5 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
SW-V-69A	3	J3		X			18	GT	MO	O	ALL	S/T	( )		
SW-V-69B	3	F3		X			18	GT	MO	O	ALL	S/T	( )		
SW-V-70A	3	J3		X			18	GT	MO	O	ALL	S/T	( )		
SW-V-70B	3	F3		X			18	GT	MO	O	ALL	S/T	( )		
SW-V-90	3	D7		X			2	GT	MO	C	ALL	S/T	( )		
SW-V-92	3	D8		X	X		2	CK	SA	C	ALL	S/E	N/A		
SW-V-201	Dwg M607, Sh 2 3	C14		X			1/2	SV	SOL	C	ALL	S/E	N/A		1
SW-V-202	Dwg M607, Sh 2 3	C14		X			1/2	CK	SA	C	ALL	S/E	N/A		
SW-V-203	Dwg M607, Sh 2 3	C14		X			1/2	CK	SA	O	ALL	S/E	N/A		
SW-V-204	Dwg M607, Sh 2 3	C14		X			1/2	SV	SOL	O	ALL	S/E	N/A		1
SW-V-206	Dwg M607, Sh 2 3	B15		X			1/2	SV	SOL	C	ALL	S/E	N/A		1
SW-V-207	Dwg M607, Sh 2 3	B15		X			1/2	CK	SA	C	ALL	S/E	N/A		
SW-V-208	Dwg M607, Sh 2 3	B15		X			1/2	CK	SA	O	ALL	S/E	N/A		
SW-V-209	Dwg M607, Sh 2 3	B15		X			1/2	SV	SOL	O	ALL	S/E	N/A		1
SW-V-210	Dwg M607, Sh 2 3	A11		X			1/2	SV	SOL	O	ALL	S/E	N/A		1
SW-V-211	Dwg M607, Sh 2 3	B11		X			1/2	SV	SOL	C	ALL	S/E	N/A		1
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

System Name REACTOR CLOSED COOLING (RCC) Dwg. No. M525 Rev. 21 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	O	CSD	S/T	( )		8
RCC-V-21	2	D10	X				10	GT	MO	O	CSD	S/T	( )		8
RCC-V-26	2	D11	X		X		10	CK	SA	O	CSD	S/E	N/A		8
RCC-V-40	2	D10	X				10	GT	MO	O	CSD	S/T	( )		8

System Name FUEL POOL COOLING SYSTEM (FPC) Dwg. No. M526 Rev. 27 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-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	( )		

System Name CONTROL ROD DRIVE (CRD, HCU) Dwg. No. M528 Rev. 21 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
CRD-V-9	2	D11	X				3/4	SV	SOL	O	CSD	S/E	N/A		1
CRD-V-10	2	K6	X				1	GB	AO	O	ALL	S/T	( )		
CRD-V-11	2	F6	X				2	GB	AO	O	CSD	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
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

System Name MAIN STEAM SYSTEM (MS) Dwg. No. M529 Rev. 25A Page 1 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
MS-V-1	1	J10		X			2	GB	MO	C	ALL	S/T	( )		
MS-V-2	1	J10		X			2	GB	MO	C	ALL	S/T	( )		
MS-V-5	1	J10		X			2	GB	MO	O	ALL	S/T	( )		
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	O	ALL	S/T	( )		
MS-V-22B	1	E12	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-22C	1	F5	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-22D	1	E5	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-28A	1	F13	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-28B	1	E13	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-28C	1	F4	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-28D	1	E4	X				26	GB	AO	O	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	( )		

System Name MAIN STEAM SYSTEM (MS) Dwg. No. M529 Rev. 25A 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
MS-V-67D	1	D4	X				1-1/2	GT	MO	C	ALL	S/T	( )		
MS-RV-1A	1	F10			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-1B	1	E11			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-1C	1	F6			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-1D	1	E7			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-2A	1	F10			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-2B	1	E10			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-2C	1	F7			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-2D	1	E7			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-3A	1	F9			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-3B	1	E9			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-3C	1	F7			X		6	S/R	AO/SA	C	REFUEL	BENCH TEST	N/A		
MS-RV-3D	1	E8			X		6	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A		
MS-RV-4A	1	F9			X		6	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-4B	1	E9			X		6	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-4C	1	F8			X		6	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.

System Name MAIN STEAM SYSTEM (MS) Dwg. No. M529 Rev. 25A 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
MS-RV-4D	1	E8			X		6	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-5B	1	E9			X		6	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-5C	1	F8			X		6	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 Rev. 25A 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
RFW-V-10A	1	G12	X		X		24	CK	SA	O	CSD	S/E	N/A		6
RFW-V-10B	1	G5	X		X		24	CK	SA	O	CSD	S/E	N/A		6
RFW-V-32A	1	G13	X		X		24	CK	AO	O	CSD	S/E	N/A		6
RFW-V-32B	1	G5	X		X		24	CK	AO	O	CSD	S/E	N/A		6
RFW-V-65A	1	G13		X			24	GT	MO	O	CSD	S/T	( )		6
RFW-V-65B	1	G4		X			24	GT	MO	O	CSD	S/T	( )		6

System Name REACTOR RECIRCULATION COOLING (RRC, HY) Dwg. No. M530 Rev. 23A 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	O	REFUEL	S/E	N/A		7
RRC-V-13B	2	B12	X		X		3/4	CK	SA	O	REFUEL	S/E	N/A		7
RRC-V-16A	2	C14	X				3/4	GT	MO	O	REFUEL	S/T	( )		7
RRC-V-16B	2	B14	X				3/4	GT	MO	O	REFUEL	S/T	( )		7
RRC-V-19	1	F11	X				3/4	SV	SOL	O	ALL	S/E	N/A		1
RRC-V-20	1	F12	X				3/4	SV	SOL	O	ALL	S/T	( )		1

System Name REACTOR RECIRCULATION COOLING (RRC, HY) Dwg. No. M 530 Rev. 23A 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-18A	2	E13	X				3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-18B	2	E13	X				3/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-19A	2	E4	X				1/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-19B	2	E4	X				1/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-20A	2	E4	X				1/4	SV	SOL	O	CSD	S/E	N/A		1, 10
HY-V-20B	2	E4	X				1/4	SV	SOL	O	CSD	S/E	N/A		1, 10

System Name FLOOR DRAIN RADIOACTIVE (FDR) Dwg. No. M539 Rev. 32A 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
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 Rev. 27 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
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 Rev. 21 Page 1 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
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 Rev. 21 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 Rev. 21 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
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 Rev. 14 Page 1 of 2

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				2-1/2	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				4	GB	HO	C	ALL	S/T	( )		

System Name CONTAINMENT ATMOSPHERE CONTROL (CAC) Dwg. No. M554 Rev. 14 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
CAC-FCV-1B	2	H6	X				4	GB	HO	C	ALL	S/T	( )		
CAC-FCV-2A	2	G10	X				4	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		2 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		
CAC-RV-63B	3	E4			X		2 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 Rev. 13A 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
CIA-V-20	2	J6	X				1/2	GB	MO	O	ALL	S/T	( )		
CIA-V-21	2	J6		X	X		1/2	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	H7		X	X		1/2	CK	SA	O	REFUEL	S/E	N/A		3

System Name MAIN STEAM LEAKAGE CONTROL (MSLC) Dwg. No. M557 Rev. 7A 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
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

System	Various
Valve(s)	Accessible IWV active valves with position indication.
ASME Classification	Code Class: Various Category: Various
Function	Various
Code Testing Requirement	IWV-3300 implies that valves which are accessible during plant operation should have their remote position indication verified more frequently than inaccessible valves.
Basis for Relief	The Summer 1979 Addenda to ASME Section XI, Subsection IWV (1977 Edition) succinctly requires all valves with remote position indication to have sucn indication verified biannually. Accessibility is not relevant in the ammended code.
Alternate Testing to be Performed	Valves with remote position indicators shall be observed at least once every two years to verify that valve operation is accurately indicated.

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) 2. Position indication verification (IWV-3300)
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". 2. Solenoid valves do not have any positive position indication.
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.

RV-1

TABLE A

Valve	Code Class	Category	Function
HY-V-17A	2	A	Hydraulic supply for Reactor
HY-V-17B	2	A	Recirculation Flow Control Valves
HY-V-18A	2	A	
HY-V-18B	2	A	
HY-V-19A	2	A	
HY-V-19B	2	A	
HY-V-20A	2	A	
HY-V-20B	2	A	
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-9	2	B	Back-up Scram Valve (Exhaust)
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
PI-VX-263	2	A	valves (S-SR-13)
PI-VX-264	2	A	
PI-VX-265	2	A	
PI-VX-266	2	A	H_2, O_2 monitor inlet and outlet
PI-VX-267	2	A	valves (S-SR-14)
PI-VX-268	2	A	
PI-VX-269	2	A	
CAS-V-453	2	A	Air supply to drywell - wetwell downcomer 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)	Valves affected by this relief request are identified in TABLE B.
ASME Classification	
Function	
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.

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.
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	Valves affected by this relief request are identified in TABLE C.
Function	
Code Testing Requirement	Quarterly testing (IWV-3412) Position indication verification (IWV-3522)
Bases for Relief	1. 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. 3. WNP-2 containment will be inerted with nitrogen during power operations.
Alternate Testing to be Performed	1. Proper valve opening will be verified during refueling outages. This can be done by partly bleeding off accumulator pressure and verifying that the pneumatic supply can repressurize the accumulator. Where redundant pneumatic supplies exist, each will be verified separately. 2. 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. Successful completion of accumulator pressure decay testing will constitute acceptable indication of check valve closure.

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	2	A-C	N_2 to ADS Accumulators (inside containment
CIA-V-36 series	2	A-C	Air supply to Main Steam Relief Valves' Accumulators (inboard check valve)
CIA-V-24 series	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.

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: 1 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.

REQUEST FOR RELIEF NO. RV-6

System	Reactor Feedwater (RFW)
Valve(s) ASME Classification Function	Valves affected by tnis relief request are identified in TABLE C.
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 snutdown.

RV-6

TABLE C

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 D.
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.

RV-7

TABLE D

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

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 E.
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 failure of this equipment. The risks associated with failure of this equipment outweigh any potential benefits derived from quarterly testing of these valves.
Alternate Testing to be Performed	Valves will be exercised during cold shutdown.

RV-8

TABLE E

Valve	Code Class	Category	Function
RCC-V-5	2	A	Isolation valves for closed 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 F.
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 to 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. (On attached sheet)
Alternate Testing to be Performed	1. Control Rod Drive Hydraulic Control Unit valves will be tested in accordance with plant Technical Specifications.

RV-9

Bases for Relief (Cont'd)

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.

RV-9

TABLE F

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 G.
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.

RV-10

TABLE G

Valve	Code Class	Category	Function
HY-V-17A	2	A	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	A	
HY-V-18A	2	A	
HY-V-18B	2	A	
HY-V-19A	2	A	
HY-V-19B	2	A	
HY-V-20A	2	A	
HY-V-20B	2	A	

REQUEST FOR RELIEF NO. RV-11

System	Residual Heat Removal
Valve(s), ASME Classification, Function	Valves affected by this request are identified in Table H.
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.

RV-11

TABLE H

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 Valves
RHR-V-9	1	X	X	
RHR-V-11A	2	X		Condensed steam return from Hx's to Wetwell
RHR-V-11B	2	X		
RHR-V-16A	2	X		Drywell spray lines' isolation valves
RHR-V-16B	2	X		
RHR-V-17A	2	X		Drywell spray lines' isolation valves
RHR-V-17B	2	X		
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 check valves
RHR-V-50B	1	X	X	
RHR-V-53A	1	X	X	Shutdown cooling return isolation valves
RHR-V-53B	1	X	X	
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-123A	1	X	X	RHR-V-50A Bypass
RHR-V-123B	1	X	X	RHR-V-50B Bypass
RHR-V-124A	2	X		RCIC steam to RHR Hx steam line drip pot drain valves
RHR-V-124B	2	X		
RHR-V-125A	2	X		
RHR-V-125B	2	X		
RHR-V-134A	2	X		Hz recombiner scrubber drains to Wetwell
RHR-V-134B	2	X		
SLC-V-4A	1	X	X	SLC pump explosive-actuated discharge valve
SLC-V-4B	1	X	X	
SLC-V-6	1	X	X	SLC injection line isolation valves
SLC-V-7	1	X	X	
RWCU-V-1	1	X	X	Cleanup Water Pump suction line isolation valves
RWCU-V-4	1	X	X	

Listing of Category A Valves

Valve	Class	Leak Rate Testing Required: Appendix J.	Leak Rate Testing Required: Section XI	Valve Function
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	2		X	S/RV discharge downcomer vacuum breakers.
MS-V-38 Series	2		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	
HY-V-17A	2	X		Isolation valves for reactor recirculation flow control valve hydraulic supply
HY-V-17B	2	X		
HY-V-18A	2	X		
HY-V-18B	2	X		
HY-V-19A	2	X		
HY-V-19B	2	X		
HY-V-20A	2	X		
HY-V-20B	2	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 discnarge 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 recomoiner 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-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-36 (series)	2	X		Main steam safety/relief valve instrument air supply check valve
CIA-V-40	2	X		N_2 supply to ADS valves (inboard insolation)
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 Reporting of Valve Inservice Test Results

Records and reports pertaining to Valve Inservice Testing will be maintained according to the intent of Article IWV-6000 of the Code. Valve Operability reference data will be kept in the Valve Operability test result (history) file at the plant.

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 in the FSAR. Due to the time required for Program publication, an administrative cut-off date of December 1980 was chosen to "freeze" drawing revisions used for Revision 0 of the Program. However, system design is not expected to change radically, and more current diagrams will be used when the Program is updated.

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 2

PUMP AND VALVE INSERVICE TEST PROGRAM PLAN

50-397
LTR DTD 11/4/83
SUPERSEDES PER REVISION 2 TO PUMP & VALVE
INSERVICE TEST PROGRAM PLAN UPDATE
WPPSS #2

PUMP AND VALVE INSERVICE TEST

PROGRAM PLAN - REV. 1

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NUCLEAR PROJECT NO. 2

Prepared by	Operations Support Engineering	8/31/82 Date
Approved by	Lead Engineer, Plant Engineering & Surveillance	9/1/82 Date
Approved by	Manager, WNP-2 Engineering	9/1/82 Date
Approved by	Assistant Director, Generation Engineering	9/1/82 Date
Reviewed by	Technical Manager, WNP-2	9/1/82 Date
Approved by	Plant Manager, WNP-2	9/1/82 Date
Reviewed by	Manager, Operational Quality Assurance	9/1/82 Date
Reviewed by	Authorized Nuclear Inservice Inspector	9/3/82 Date

RECORD OF PROGRAM PLAN REVISIONS

No.	DATE	REVISIONS		BY	CH'D	APP'D
1	8/28/82			MPRes	RL Webring	TF Hoyle
0	4/23/81	ORIGINAL		MPRes	F. Friend	E.W. Pate

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-I	1		3-16	1
				3-17	1
2.0 Table of Contents	2-I	1		3-18	1
				3-19	1
3.0 Pump Test Program	3-I	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 Valve Inservice Test Program (Contd)	4-6	1	4.0 WNP-2 Valve Inservice Test Program (Contd)	4-26	1
	4-7	1		4-27	1
	4-8	1		4-27a	0
	4-9	1		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
	4-16	1		4-35	1
	4-17	1		4-36	1
	4-18	1		4-37	1
	4-19	1		4-38	1
	4-20	1		4-39	1
	4-21	1		4-40	1
	4-22	1		4-41	1
	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 Valve Inservice Test Program (Contd)	4-46	1	4.0 WNP-2 Valve Inservice Test Program (Contd)	4-66	1
	4-47	0		4-67	1
	4-48	0		4-68	0
	4-49	1		4-69	0
	4-50	1		4-70	1
	4-51	1		4-71	1
	4-52	1		4-72	0
	4-53	1		4-73	1
	4-54	1		4-74	1
	4-55	1		4-75	0
	4-56	1		4-76	0
	4-57	1		4-77	0
	4-58	1			
	4-59	1			
	4-60	1			
	4-61	1			
	4-62	1			
	4-63	1			
	4-64	1			
	4-65	1			

*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 Adderda 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.

---

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

Surveillamce testing is performet to etect equipment malfunction or degradation and to initiate correctiwe actiom. Since the safety related pumps are normally in a stamdby mode, eriodic testing of this equipment is especially important. The WNP-2 Pum Imservice Test Program provides a schedule for testing safety related umps and will be implemented as part of the nrmal surveillance routin.

It is antficipted that reference data will be gathered during initial surveillamce tests. In most cass, tet parameters will be measured with normal plant instrumentatiom. This aproach will simplify the test program and will promote timely comlectio of surveillance testing. When permanentTy intalled instrumentation s not available, portable instrumentation will be used to record the equired parameters.

During subsequent surveillamce tests, flow rate will normally be selected as the indepemdent test parametr and will be set to match the reference flow rate. Then other hydraulic and mchanical performance parameters will be measured and evaluated agaimst the appropriate reference values. The results of such evaluations will determine whether or mot corrective actiom 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 ection will identify test objectives, reference applicable Technical Specifications and note the operating modes for which the test is apropriate.

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

c) Test Instructions. Directims will be sufficiently detailed to assure completeness and uniformity of testing. Instructions will include provisions for returning system to its normal standby configuratio 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_d	Differential Pressure, ΔP	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 ΔP.

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_r, 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 RR-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

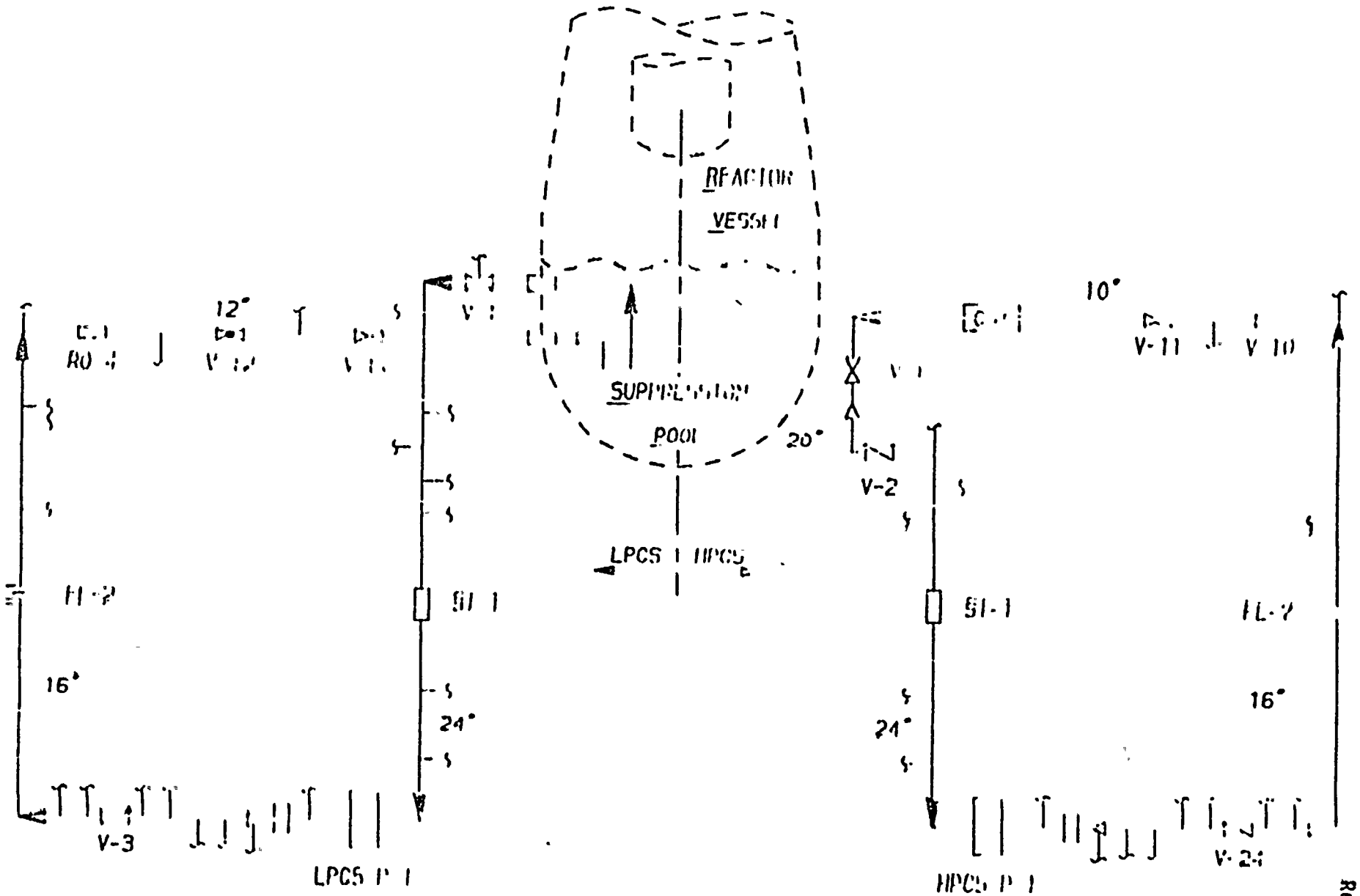
Spray pond level and pump discharge pressure will be recorded during the testing of these pumps.

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.



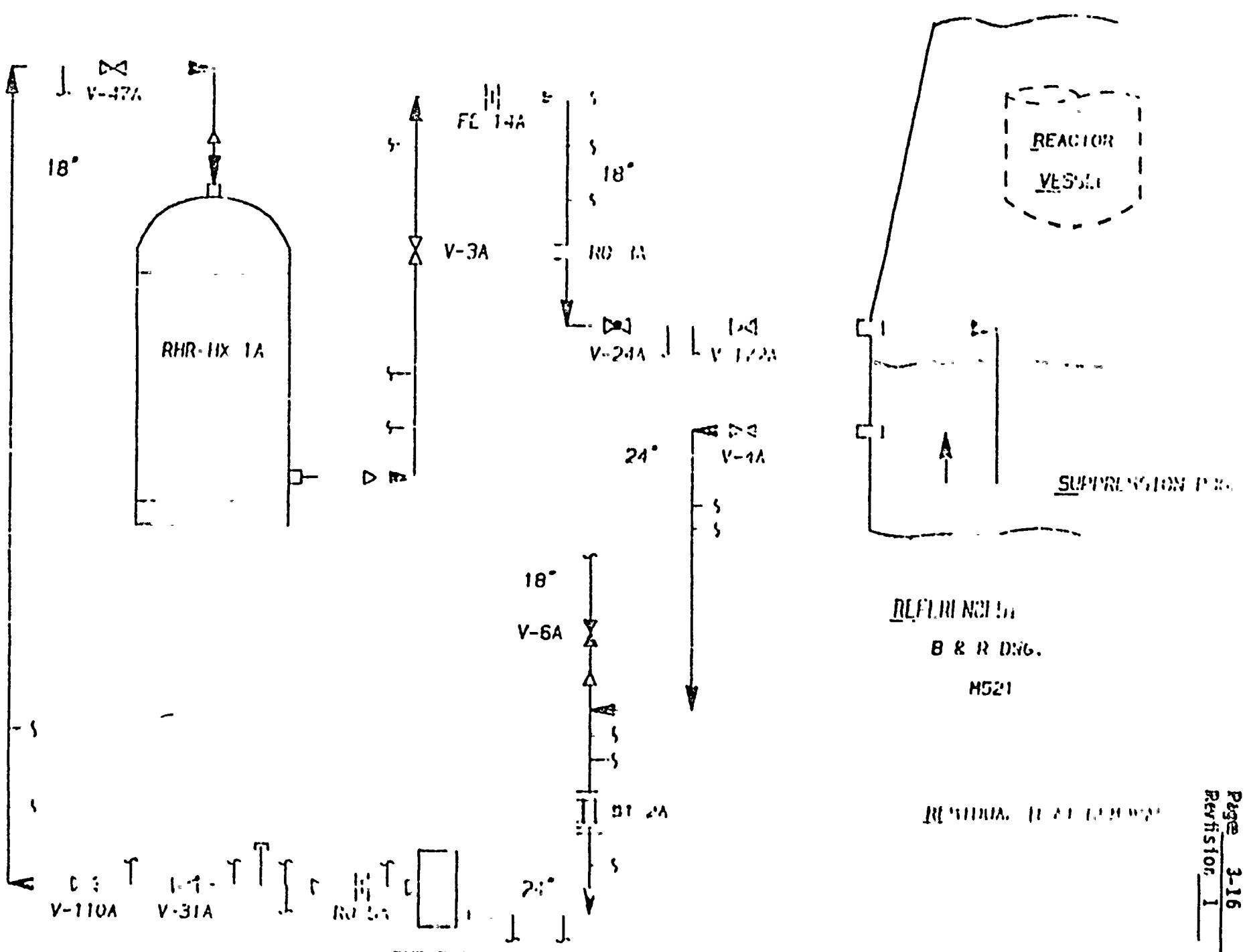
REFERENCES:

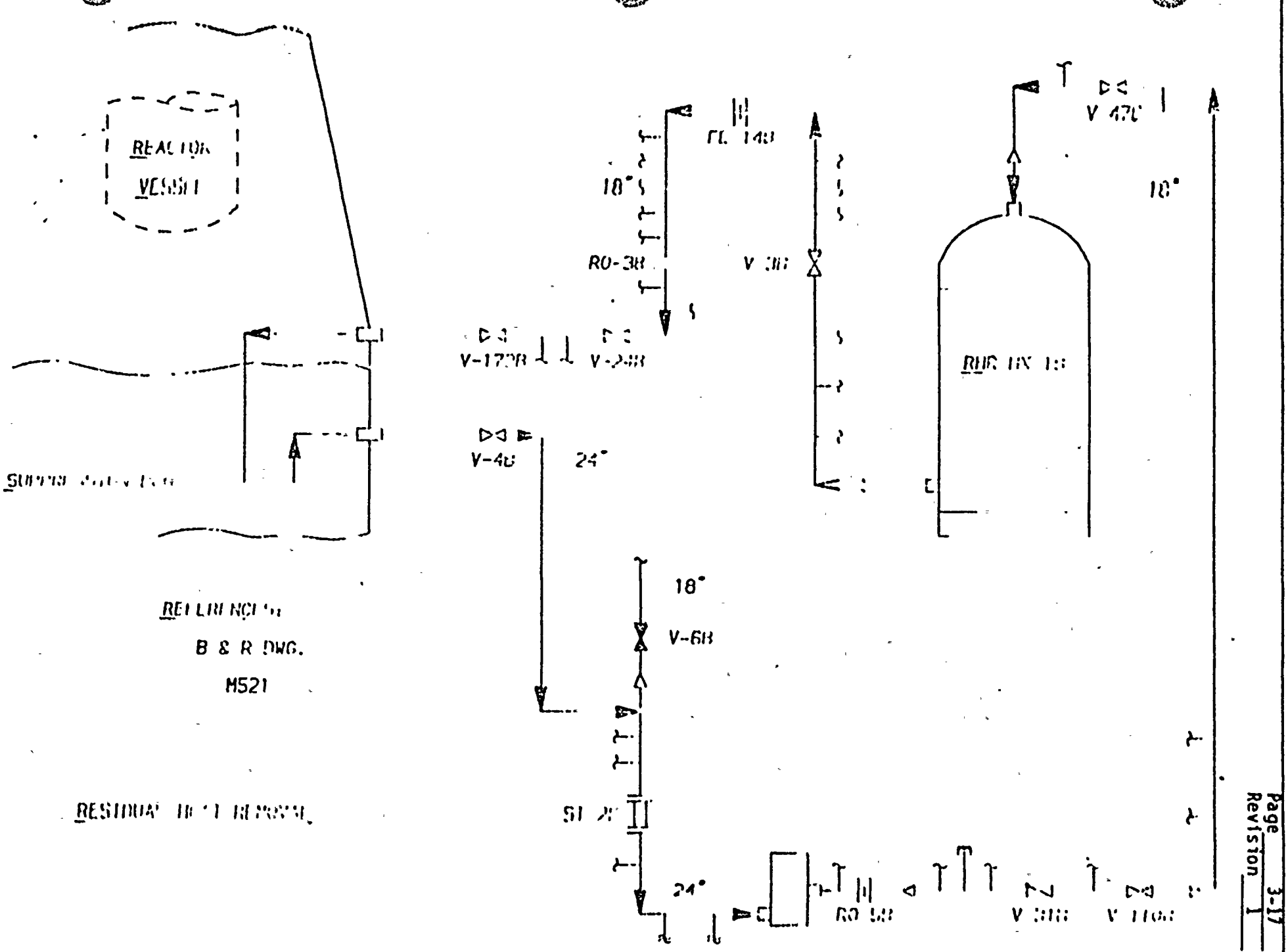
B & R DWG.

M520

HIGH PRESSURE CORE SPRAY

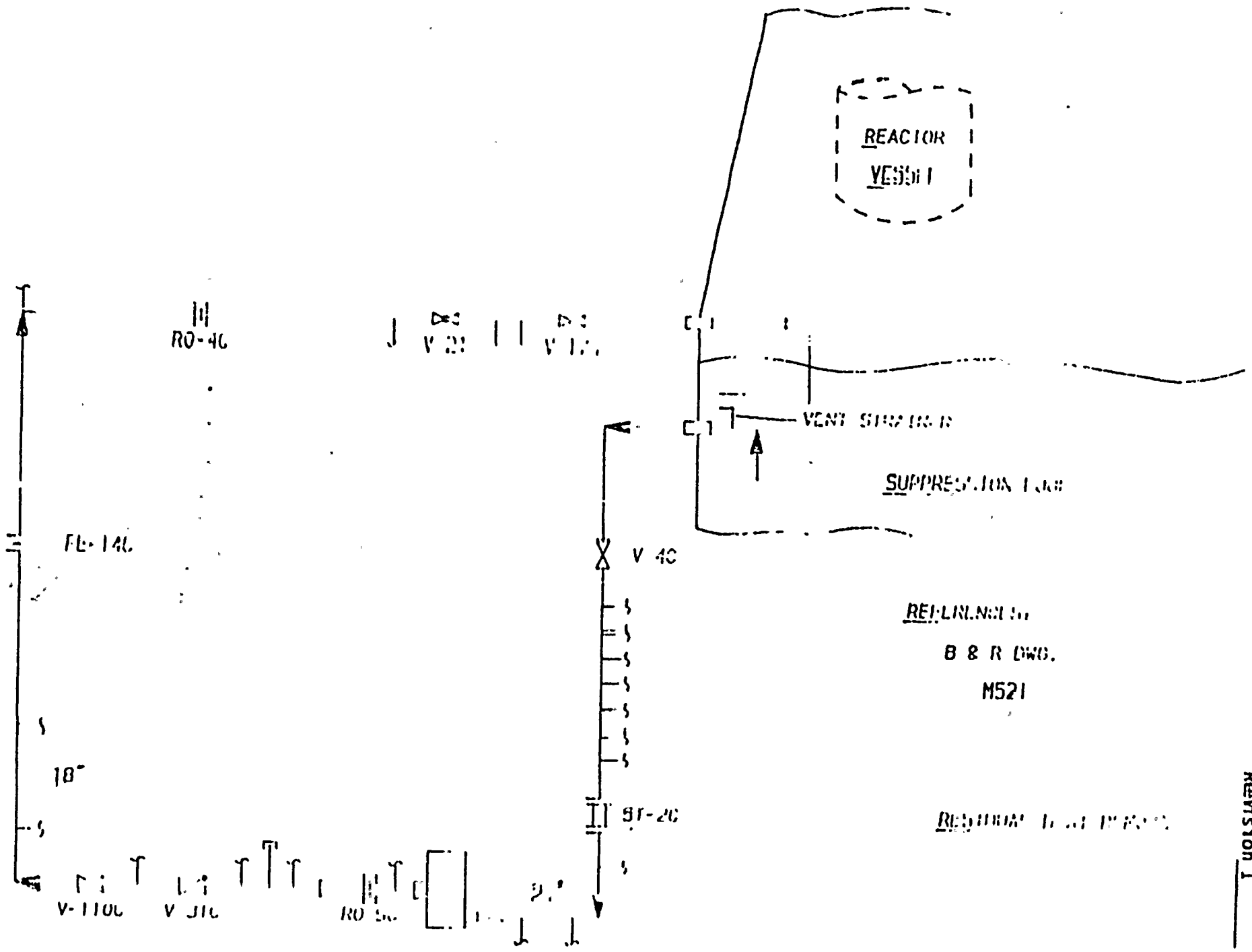
LOW PRESSURE CORE SPRAY


V-47A
18"
RHR-HX 1A
FE 14A
18"
V-3A
RO 8A
V-24A
REACTOR
VESSEL
24"
V-4A
18"
V-6A
V-110A
V-31A
RHR-P 2A
REFERENCE
B & R DWG.
M521
Page 3-16
Revision 1
P&V

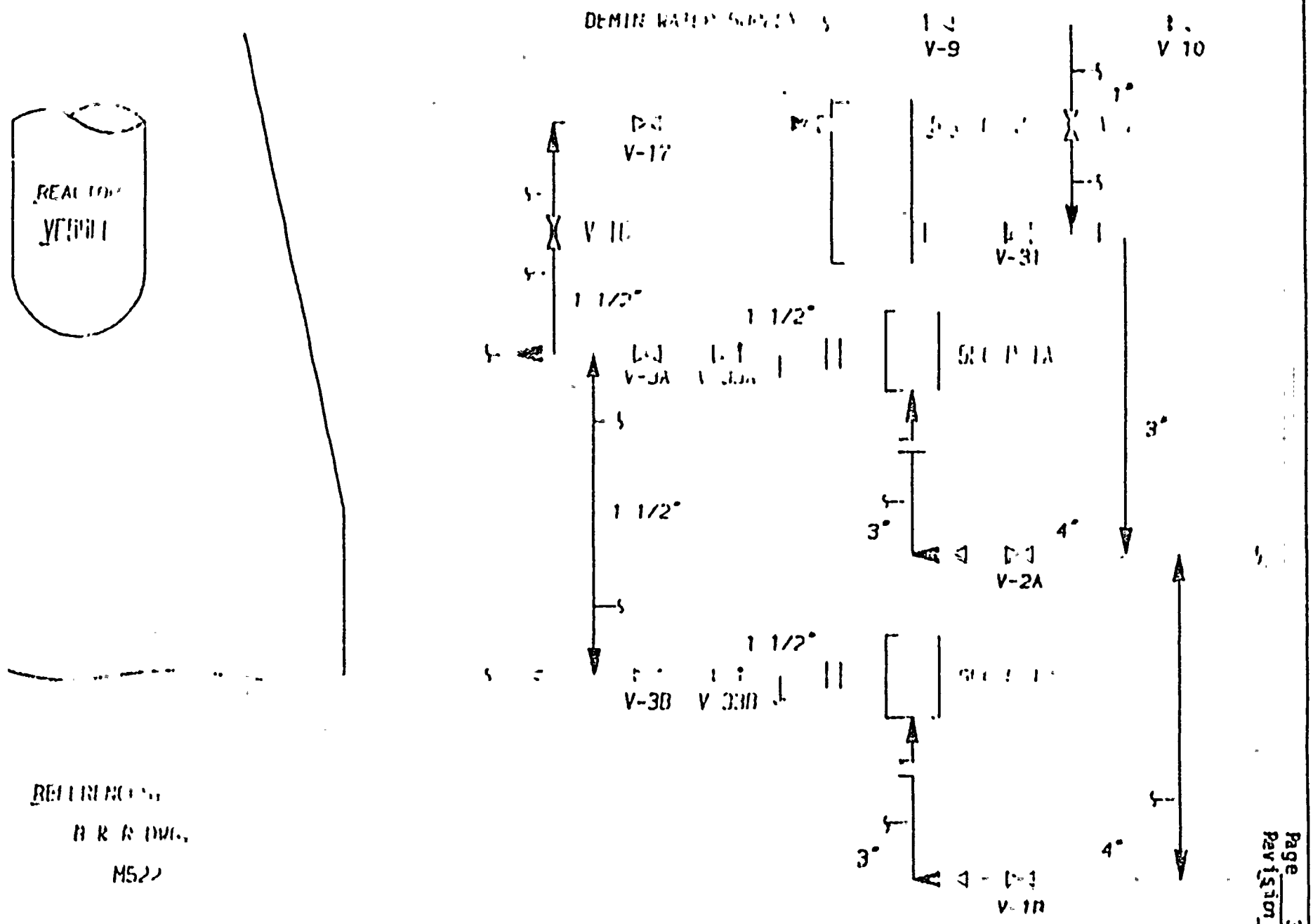


REFERENCE
B & R DWG.
M521

RESIDUAL HEAT REMOVAL


REACTOR
VESSEL
RO-4C
V 4C
FE-14C
18"
SI-2C
RHR P 2C
REFERENCE
B & R DWG.
M521

P&V D



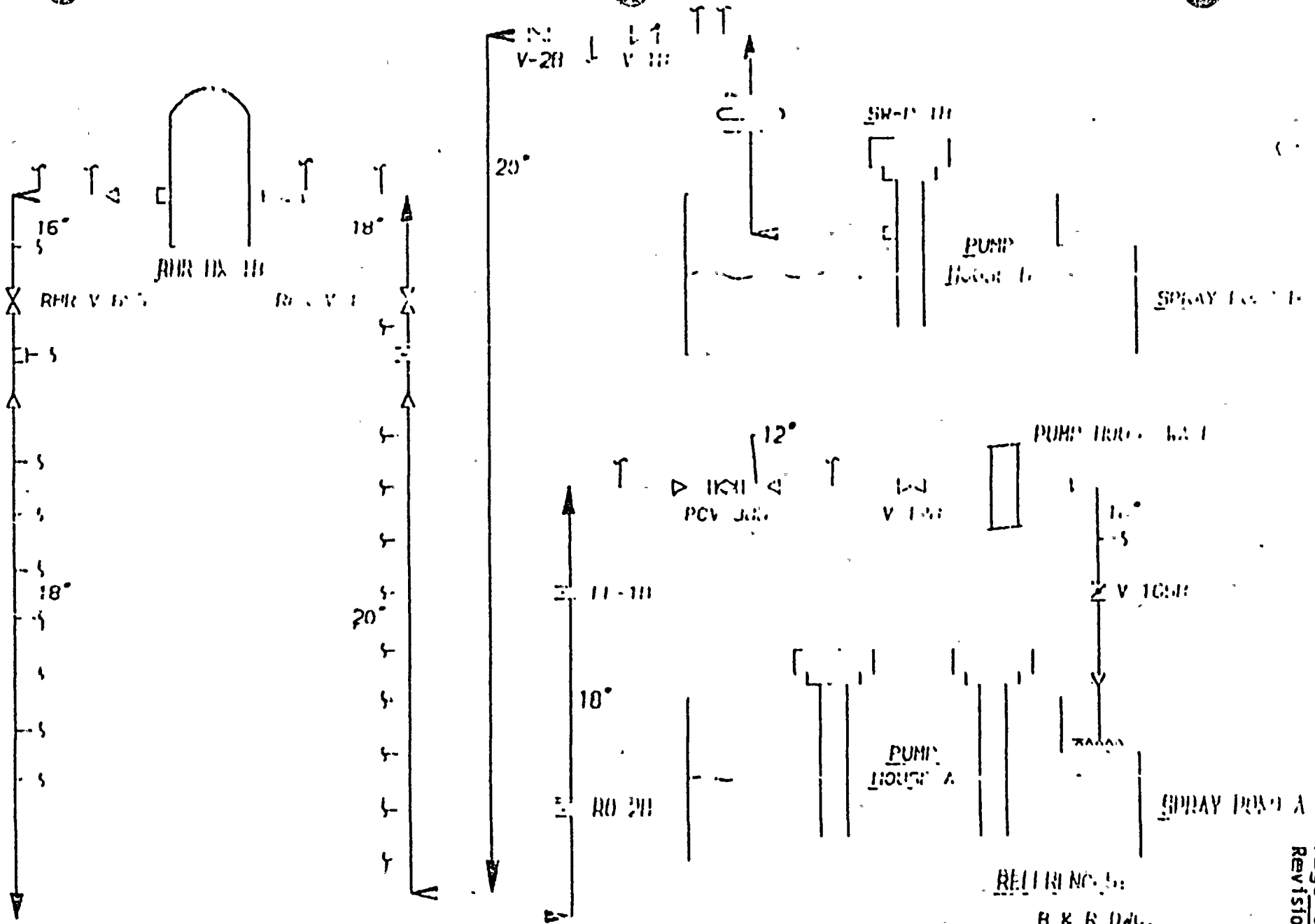
REFERENCE

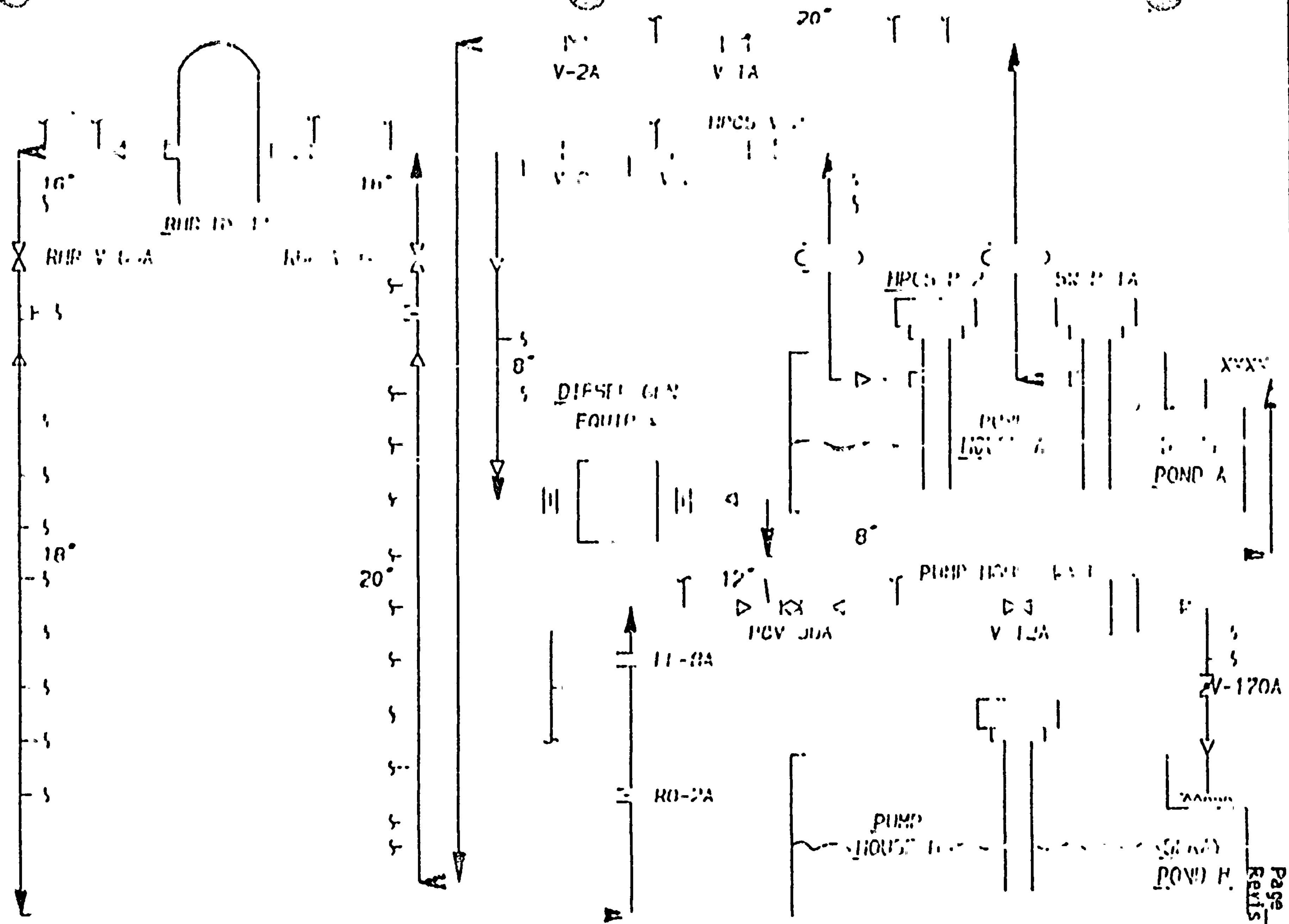
M522

STANDBY LIQUID CONTROL

Page 3-19
Revision 1

PSVE


16"
18"
18"
20"
20"
12"
18"
PUMP
HOUSE A
SPRAY POND A
SERVICE WATER
B & R DWG.
NO. 24



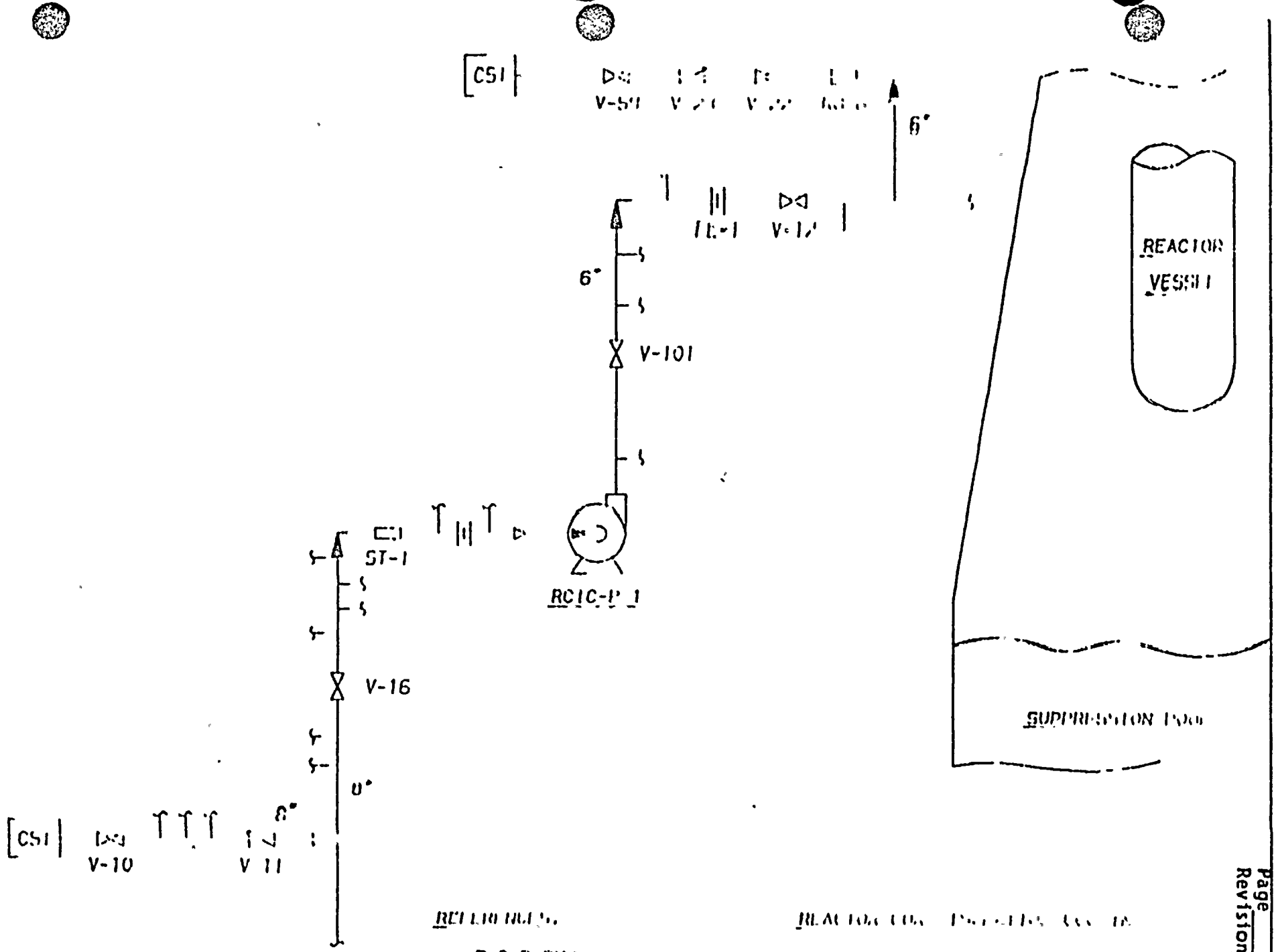
REFERENCES:

B & R DWG.

M524

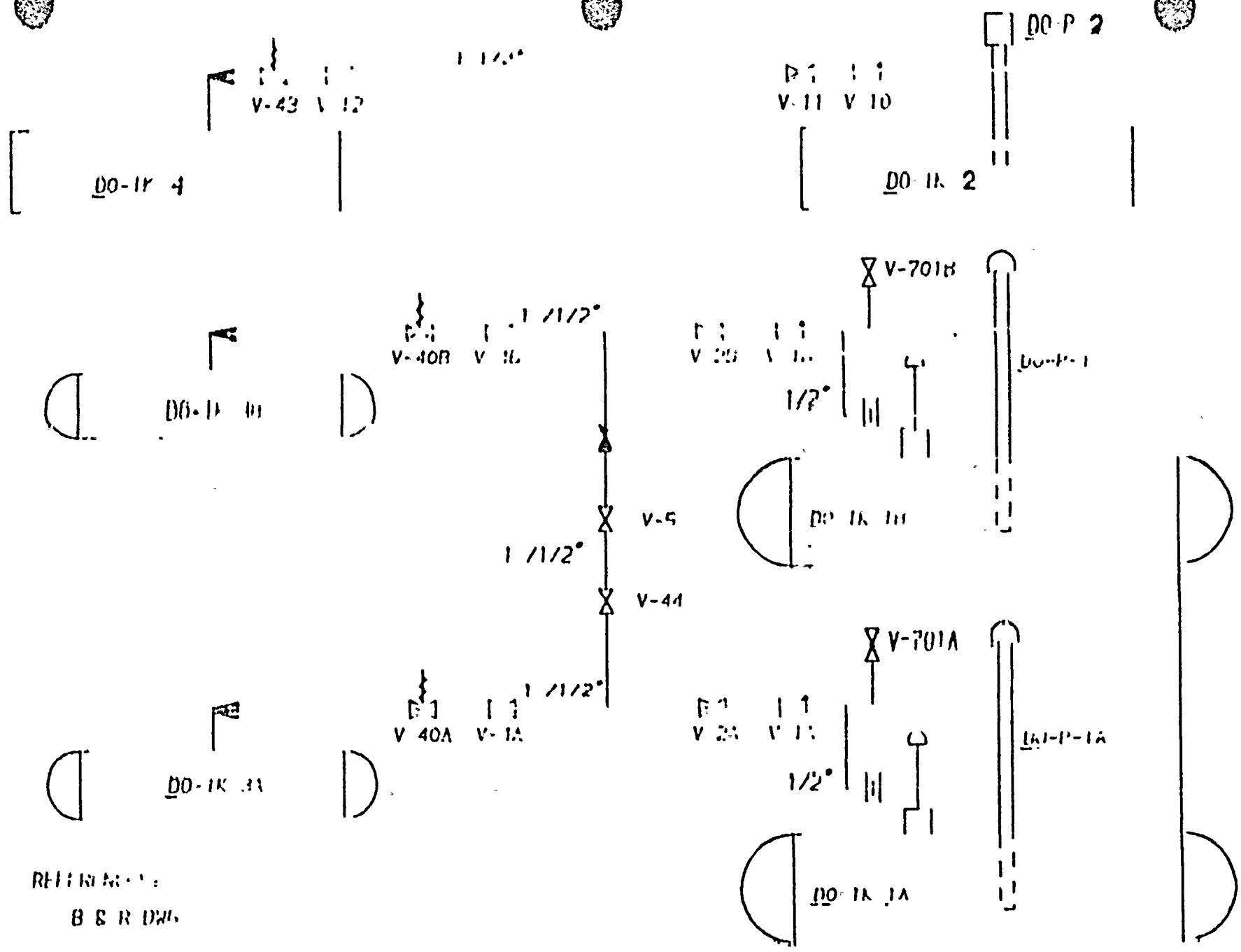
SERVICE WATER

P&ID

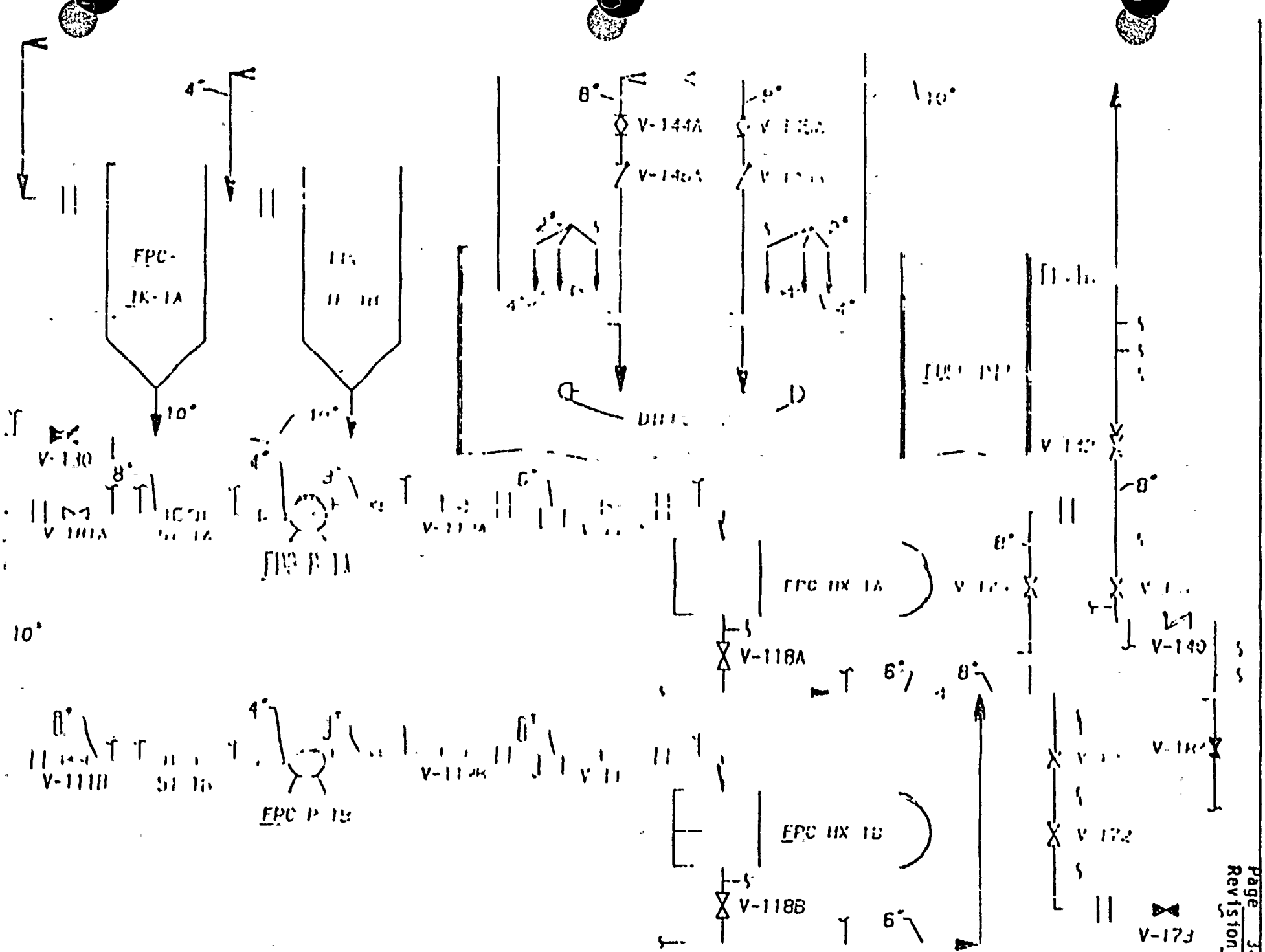

REACTOR VESSEL
SUPPRESSION POOL
6"
V-101
RCIC-P-1
ST-1
V-16
8"
V-10
V-11

B & R DWG

H519



REFERENCE
B & R DWG


V-144A
V-118A
V-118B
V-173
10"
8"
6"
4"

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 IP-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 ΔP (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

EQUIPMENT SKETCH

Legend:
Pickup Point
Bearing
Coupling

Perfomed by Date

Verified by Date

Alert Range: Vel. > .157 in/sec

Action Range: Vel. >.314 in/sec

OPERATING CONDITIONS

Drive Equipment:
Volts Amps RPM
Temp. Outbd. Bear. °
Inbd. Bear. °

Driven Equipment
Sys. Temp.
Temp. Outbd. Bear. °
Inbd. Bear. °

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. That 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 FSSAR 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 or 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.

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 II 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 consistency 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.

---

(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) 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.

(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
	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-200).

(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) Test	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 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	Remarks For Relief
CAS-V-451	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 517 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
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-10	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		

System Name REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) Drg. No. M 519 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
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 510 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
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-60	2	E7	X				10	GT	MO	O	ALL	S/T	( )		
RCIC-V-89	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-006	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		?
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-10	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		

Rev 4.13
Revision 1

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	CSD	S/E	N/A		?
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-15	2	C4			X		1 x 2	RV	SA	C	REFUEL	BENCH TEST	N/A		

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 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	( )		

Page 4.15
Revision 1

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521 Page 2 of 6

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	F12	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		7
RHR-V-41B	1	G8	X		X		14	CK	AO	C	CSD	S/E	N/A		7
RHR-V-41C	1	G10	X		X		14	CK	AO	C	CSD	S/E	N/A		7
RHR-V-42A	1	G11	X				14	GT	MO	C	ALL	S/T	( )		

Page 4-16
Revision 1

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. M521 Page 3 of 6

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-51A	1	G11	X				12	GB	MO	C	CSD	S/T	( )		11
RHR-V-51B	1	G7	X				12	GB	MO	C	CSD	S/T	( )		11

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Drg. No. M521 Page 4 of 6

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
RIR-V-60A	2	H12	X				3/4	SV	SOL	C	ALL	S/E	N/A		1
RIR-V-60B	2	J5	X				3/4	SV	SOL	C	ALL	S/E	N/A		1
RIR-V-68A	3	M524 REV. 19 H12			X		16	GT	MO	O	ALL	S/T	( )		
RIR-V-68B	3	M524 REV 19 H11	X				16	GT	MO	O	ALL	S/T	( )		
RIR-V-75A	2	H12	X				3/4	SV	SOL	C	ALL	S/E	N/A		
RIR-V-75B	2	J5	X				3/4	SV	SOL	C	ALL	S/E	N/A		
RIR-V-84A	2	B13	X	X			1 1/2	CK	SA	C	ALL	S/E	N/A		
RIR-V-84B	2	B7	X	X			1 1/2	CK	SA	C	ALL	S/E	N/A		
RIR-V-84C	2	B4	X	X			1 1/2	CK	SA	C	ALL	S/E	N/A		
RIR-V-89	2	J6	X	X			14	CK	MO	C	ALL	S/E	N/A		
RIR-V-101A	2	F14	X	X			2	CK	SA	C	ALL	S/E	N/A		
RIR-V-101B	2	F4	X	X			2	CK	SA	C	ALL	S/E	N/A		
RIR-V-103A	2	F14	X	X			2	CK	SA	C	ALL	S/E	N/A		
RIR-V-103B	2	F4	X	X			2	CK	SA	C	ALL	S/E	N/A		

System Name RESIDUAL HEAT REMOVAL SYSTEM (RHR) Dwg. No. 4521 Page 5 of 6

Valve Number	Class	Coordinates	Valve Category A	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 TST	N/A		
RHR-V-111B	1	G8	X	14	GT	MAN	O	REFUEL	POS TST	N/A		
RHR-V-111C	1	G9	X	14	GT	MAN	O	REFUEL	POS TST	N/A		
RHR-V-112A	1	G9	X	12	GT	MAN	O	REFUEL	POS TST	N/A		
RHR-V-112B	1	G8	X	12	GT	MAN	O	REFUEL	POS TST	N/A		
RHR-V-113	1	G9	X	20	GT	MAN	O	REFUEL	POS TST	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-107	2	J8	X	1/1	SV	SOL	O	ALL	S/T	N/A		1
RHR-V-[illegible]	1	F10	X	1/4	CK	SA	C	REFUEL	S/T	N/A		4

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

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-35	2	D13		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	Cordinates	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	SQUIB	C	REFUEL	IWV 3610	N/A		
SLC-V-4B	1	D8				X	1-1/2	SHEAR PLUG	SQUIB	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		

Page 4-21
Rev 5000 1

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	O	ALL	S/T	( )		
RWCU-V-4	1	E15	X				6	GT	MO	O	ALL	S/T	( )		
RWCU-V-40	1	H11	X				6	GT	MO	O	ALL	S/T	( )		

System Name STANDBY SERVICE WATER (SW) Dwg. No. M524 Page 1 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-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 G8	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. M624 M607 Page 9 of 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
SW-V-69A	3	Sh 1 G3	X				18	GT	MO	O	ALL	S/T	( )		
SW-V-69B	3	Sh 2 F3	X				18	GT	MO	O	ALL	S/T	( )		
SW-V-70A	3	Sh 1 G2	X				18	GT	MO	O	ALL	S/T	( )		
SW-V-70B	3	Sh 2 F3	X				18	GT	MO	O	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	O	ALL	S/E	N/A		
SW-V-204	3	Dwg M607, Sh 2 C14	X				1/2	SV	SOL	O	ALL	S/E	N/A		1
SW-V-205	3	Dwg M607, Sh 2 B16	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	O	ALL	S/E	N/A		
SW-V-209	3	Dwg M607, Sh 2 B15	X				1/2	SV	SOL	O	ALL	S/E	N/A		1
SW-V-210	3	Dwg M607, Sh 2 A11	X				1/2	SV	SOL	O	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 (SW) Dwg. No. M524 M507 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	3 (Dwg M507, Sh 2)	A14	X	1/2	SV	SOL	O	ALL	S/E	N/A		1
SW-V-213	3 (Dwg M507, Sh 2)	B13	X	1/2	SV	SOL	C	ALL	S/E	N/A		1
SW-V-214	3 (Dwg 574 Sh 9)	G8	X	6	BF	AO	C	ALL	S/T	( )		
SW-V-215	3	Sh 2 G13	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 H13	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	O	CSD	S/T	( )		B
RCC-V-21	2	D10	X				10	GT	MO	O	CSD	S/T	( )		B
RCC-V-26	2	D11	X		X		10	CK	SA	O	CSD	S/E	N/A		B
RCC-V-40	2	D10	X				10	GT	MO	O	CSD	S/T	( )		B
RCC-V-104	2	F10	X				10	GT	MO	O	CSD	S/T	( )		B
RCC-V-129	3	E5		X			8	GT	MO	O	ALL	S/T	( )		
RCC-V-130	3	E6		X			8	GT	MO	O	ALL	S/T	( )		
RCC-V-131	3	E6		X			8	GT	MO	O	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	Remarks For Relief
FPC-V-112A	3	D12	X				6	CK	SA	O	ALL	S/T	N/A		
FPC-V-112B	3	D12	X				6	CK	SA	O	ALL	S/T	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	E9	X				6	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 Scram Valve diaphragms	9
CRD-V-110B	2	D13	X				1-1/2	SV	SOL	N/A	CSD	S/E	N/A		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 ROD DRIVE UNITS	9
HCU-V-121	2	C4	X					SV	SV	C	ALL	S/E	N/A		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

System Name CONTROL ROD DRIVE (CRD, HCU) Dwg. No. M528 Page 7 of 7

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

System Name MAIN STEAM SYSTEM (MS) Dwg. No. M029 Page 1 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
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	GA	AO	O	ALL	S/T	( )		
MS-V-22B	1	F12	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-22C	1	F5	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-22D	1	E6	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-28A	1	F13	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-28B	1	E13	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-28C	1	F4	X				26	GB	AO	O	ALL	S/T	( )		
MS-V-28D	1	E4	X				26	GB	AO	O	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	( )		

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

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 Position	Test During	Test	Stroke Time	Notes	Remarks for Relief
MS-RV-4D	1	L8			X		6 x 10	S/R	AO/SA	C	REFUEL	S/E* BENCH TEST	N/A	ADS VALVE	
MS-RV-5B	1	F9			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 A	B	C	D	Size Inches	Valve Type	Actuator Type	Normal Position	Test During	Test	Stroke Time	Notes	Requests For Relief
RFW-V-10A	1	G12	X		X		24	CK	SA	O	CSD	S/E	N/A		R
RFW-V-10B	1	G5	X		X		24	CK	SA	O	CSD	S/E	N/A		R
RFW-V-32A	1	G13	X		X		24	CK	AO	O	CSD	S/E	N/A		R
RFW-V-32B	1	G5	X		X		24	CK	AO	O	CSD	S/E	N/A		R
RFW-V-65A	1	G13		X			24	GT	MO	O	CSD	S/T	( )		R
RFW-V-65B	1	G4		X			24	GT	MO	O	CSD	S/T	( )		R

System Name REACTOR RECIRCULATION COOLING (RRC, HY) Dwg. No. M510 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	O	REFUEL	S/E	N/A		7
RRC-V-13B	2	B12	X	X			3/4	CK	SA	O	REFUEL	S/E	N/A		7
RRC-V-16A	2	C14	X				3/4	GT	MO	O	REFUEL	S/T	( )		7
RRC-V-16B	2	B14	X				3/4	GT	MO	O	REFUEL	S/T	( )		7
RRC-V-19	1	F11	X				3/4	SV	SOL	O	ALL	S/E	N/A		1
RRC-V-20	1	F12	X				3/4	SV	SOL	O	ALL	S/E	N/A		1

Page 4
Revision

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	Remests 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 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
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 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	Request 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 Page 1 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	Remarks 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 (CYB, PI) Dwg. No. M543 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
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-258	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 Page 1 of 2

ACCIDENT MITIGATION

Valve Number	Class	Coordinates	Valve Category X	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	MO	C	ALL	S/T	( )		
CAC-V-1B	2	F1	X				2	DIA	MO	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	MO	C	ALL	S/T	( )		
CAC-V-2B	2	F5	X				4	DIA	MO	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-3100A	2	D12		X			1	GT	MAN	C	REFUEL	POS IND	N/A		
CAC-V-3100B	2	D12		X			1	GT	MAN	C	REFUEL	POS IND	N/A		
CAC-FCV-1A	2	H10	X				2-1/2	GB	MO	C	ALL	S/T	( )		

System Name CONTAINMENT ATMOSPHERE CONTROL (CAC) Dwg. No. M5SA 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
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 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	Requested 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-38A	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	B	C	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	C6		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	E6		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	E9		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	E6		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	( )		

Page 142
Revision 1

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)

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 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
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 outboard 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. Overpressurization 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 quencomers.
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-19A, B	1, A-C	Reactor feedwater inboard check valves
RFW-V-33A, 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
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
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-I

TABLE A

Valve	Code Class	Category	Function
HY-I-17A, B	2	B	Hydraulic supply for Reactor Recirculation Flow Control Valves
HY-I-18A, B	2	B	
HY-I-19A, B	2	B	
HY-I-20A, B	2	B	
HY-I-33A, B	2	B	
HY-I-34A, B	2	B	
HY-I-35A, B	2	B	
HY-I-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-I-40A	3	B	Diesel fuel oil day tank 3A inlet valve
DO-I-40B	3	B	Diesel fuel oil day tank 3B inlet valve
DO-I-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-252	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
PI-VX-263	2	A	valves (S-SR-13)
PI-VX-264	2	A	
PI-VX-265	2	A	
PI-VX-266	2	A	H_2, O_2 monitor inlet and outlet
PI-VX-267	2	A	valves (S-SR-14)
PI-VX-268	2	A	
PI-VX-269	2	A	
CAS-V-453	2	A	Air supply to drywell - wetwell downcomer 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 V. 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-205	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	LOCS 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-20B	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, 35 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, 35 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 10CFR , 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 (IW-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 imitiation 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-5

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-55A	1	A	Reactor Feedwater stop valves.
RFW-V-55B	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.

RI-7

TABLE E

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

REQUEST FOR RELIEF NO. RW-8

System	Reactor Closed Coolant (RCC)
Valve(s)	
ASME Classification Function	Valves effected 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 siggests that such valves are not required to be tested to normal IWV schedules. Therefore, granting of this relief request will contribute to acceptable leve's 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 prowided as the Program is updated.