Beaver Valley Power Station, Unit No. 2

Inservice Testing Program

Issue 2, Revision 2

ENCLOSURE 2

BVPS-2 IST Program (Issue 2, Revision 2)

DUQUESNE LIGHT COMPANY

Beaver Valley Power Station

Unit 2

INSERVICE TESTING (IST) PROGRAM FOR PUMPS AND VALVES

Issue 2 **Revision 2**

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SECTION I: PUMP TESTING REQUIREMENTS

The Inservice Testing (IST) Program for pumps at Beaver Valley Power Station (BVPS), Unit 2, is based on the following:

- American Society of Mechanical Engineers (ASME)/American National Standards Institute (ANSI) Operational and Maintenance (OM) Standard, Part 6, "Inservice Testing of Pumps in Light Water Reactor Power Plants" (OM-6), OMa-1988 addenda to the OM-1987 edition, in accordance with the ASME Boiler and Pressure Vessel Code, Section XI, 1989 edition (the Code).
- Generic Letter No. 89-04, "Guidance on Developing Acceptable Inservice Testing Programs".
- NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants".

The pumps included in this program are all ASME Class 1, 2, or 3 centrifugal and positive displacement pumps that are provided with an emergency power source, which are required in shutting down a reactor to the cold shutdown condition, maintaining the cold shutdown condition, or mitigating the consequences of an accident, at BVPS, Unit 2.

The requirements of the Code and Generic Letter No. 89-04 including Supplement 1 (NUREG-1482) will be followed at all times unless specific relief has been granted by the NRC. An inservice test, run quarterly, to measure or observe the test quantities listed in Table 2 of OM-6, below, is required for all pumps in the IST Program.

TABLE 2
INSERVICE TEST PARAMETERS

Quantity	Remarks
Speed: N	**If variable speed**
Differential Pressure: ΔP	**Centrifugal Pumps, including vertical line shaft pumps**
Discharge Pressure: P	**Positive Displacement Pumps**
Flow Rate: Q	
Vibration: Velocity, V_v	**Peak**

Table 3b of OM-6, below, shows the allowable ranges for test results that will be used to determine if corrective action is required following performance of BVPS-2 Surveillance Tests. The test data will be compared to the ranges applied to the reference values for each test quantity.

TABLE 3b
RANGES FOR TEST PARAMETERS (PRESSURES AND FLOWS)

Test Parameter	Acceptable Range	Alert Range		Required Action Range	
		Low	High	Low	High
P (Positive displacement pumps)	0.93 to 1.10P_r	0.90 to < .93P_r	----	<0.90P_r	>1.10P_r
ΔP (Vertical line shaft pumps)	0.95 to 1.10ΔP_r	0.93 to <.95ΔP_r	----	<0.93ΔP_r	>1.10ΔP_r
Q (Positive displacement vertical line shaft pumps)	0.95 to 1.10Q_r	0.93 to <.95Q_r	----	<0.93Q_r	>1.10Q_r
ΔP (Centrifugal pumps)	0.90 to 1.10ΔP_r	----	----	<0.90ΔP_r	>1.10ΔP_r
Q (Centrifugal pumps)	0.90 to 1.10Q_r	----	----	<0.90Q_r	<1.10Q_r

GENERAL NOTE: The subscript r denotes reference value.

The limits for vibration readings are taken from Table 3a of OM-6, below.

TABLE 3a[1]
RANGES FOR TEST PARAMETERS (VIBRATIONS)

Pump Type	Pump Speed	Test Parameter	Acceptable Range	Alert Range	Required Action Range
Centrifugal and vertical line shaft	≥600 rpm	V_V	≤2.5 V_r	>2.5 V_r to 6 V_r or >0.325 in./sec.	>6 V_r or >0.70 in./sec.
Reciprocating		V_V	≤2.5 V_r	>2.5 V_r to 6 V_r	>6 V_r

NOTES:
(1) Vibration parameter per Table 2. V_r is vibration reference value in in./sec.

Corrective action shall be taken if necessary using the following:

1. If deviations fall within the "Alert Range" of Tables 3a and 3b of OM-6, the frequency of testing shall be doubled until the cause of the deviation is determined and the condition corrected.

2. If the deviations fall within the "Required Action Range" of Tables 3a and 3b of OM-6, the pump shall be declared inoperable immediately until the cause of the deviation has been determined and the condition corrected. An evaluation of the pump's condition with respect to system operability and technical specifications shall also be made as follows:

   a. If the inoperable pump is specifically identified in the technical specifications, then the applicable technical specification action statements shall be followed.

   b. If the inoperable pump is in a system covered by a technical specification, an assessment of its condition shall be made to determine if it makes the system inoperable. If the condition of the pump renders the system inoperable, then the applicable system technical specification action statements shall be followed.

c. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any technical specification.

3. When tests show deviations outside of the acceptable range of Table 3a or 3b of OM-6, the instruments involved may be recalibrated and the test rerun. This is an alternative to replacement or repair, not an additional action that can be taken before declaring the pump inoperable.

4. The pump shall not be returned to service until the condition has been corrected. The corrective action shall be considered completed when a satisfactory inservice test has been conducted in accordance with Paragraph 4.4 of OM-6.

Per Paragraph 5.6 of OM-6 each pump shall run at least 2 minutes under conditions as stable as the system permits prior to measurement of the specified parameters.

Utilization of a pump curve in the BVPS-2 IST Program for performing testing and establishing acceptance criteria requires specific relief approved by the NRC prior to usage. The following guidance provided by NUREG-1482, Section 5.2 relating to the use of a pump curve shall be followed:

1. A pump curve shall be developed, or manufacturer's pump curve validated, when the pump is known to be operating acceptably.

2. The reference points used to develop or validate a pump curve shall be measured using instruments at least as accurate (accuracy and range) as required by OM-6, Paragraphs 4.6.1.1 and 4.6.1.2.

3. A pump curve shall be based on an adequate number of reference points, with a minimum of five (5).

4. Sufficient reference points shall be beyond the "flat" portion (low flow rates) of the pump curve in a range which includes or is as close as practical to the design basis flow rate.

5. Acceptance criteria based on a pump curve shall not conflict with technical specifications or UFSAR operability criteria (minimum operating point/curve) for flow rate and differential pressure, for the affected pump.

6. If vibration levels vary significantly over the range of pump conditions, a method of assigning appropriate vibration acceptance criteria should be developed for regions of the pump curve.

7. When the reference pump curve may have been affected by repair, replacement, or routine servicing, a new reference pump curve shall be determined or the previous pump curve revalidated by an inservice test.

Manufacturer supplied skid-mounted pumps which are integral sub-components of, and are required to support operation of a parent pump or other component, are often times not designed to be tested in accordance with the ASME XI Code, regardless of their ASME Code class. Therefore, ASME Code class manufacturer supplied skid-mounted pumps are not included in the BVPS Unit 2 IST Program because it has been recognized by the NRC in NUREG-1482, Section 3.4, that the test of the parent pump or other component itself challenges the operability of the sub-components. This ensures that the skid-mounted pumps operate acceptably commensurate with their safety functions provided satisfactory

performance of the parent pump or other component is demonstrated by an applicable surveillance test.

Records of the results of inservice tests and corrective actions as required by Paragraph 7 of OM-6 are trended in tabular form. Pump performance characteristics will be examined for trends.

The following five sections of this document are the "Pump Outlines", "Pump Cold Shutdown Justifications", "Pump Refueling Outage Justifications", "Pump Relief Requests", and "Pump Minimum Operating Point (MOP) Curves" sections.

The "Pump Outlines" section is a listing of all the pumps in the IST Program, their testing requirements, and their specific pump cold shutdown justification, refueling outage justification, and/or relief request reference numbers. The pumps are arranged according to system and pump mark number. The following abbreviations and designations are used on the Pump Outlines and throughout the IST Program for pumps:

N - Speed

P - Discharge Pressure

ΔP - Differential Pressure

Q - Flowrate

V - Vibration

2BVT - Unit 2 Beaver Valley Test

2OST - Unit 2 Operating Surveillance Test

Q - Quarterly Test Frequency

CSD - Cold Shutdown Frequency

R - Refueling Test Frequency

2 YR - Required every 2 years, but normally done at refueling

PRR - Pump Relief Request

PCSJ - Pump Cold Shutdown Justification

PROJ - Pump Refueling Outage Justification

X - Meets or exceeds OM-6 requirements

NA - Not Applicable

The "Pump Cold Shutdown Justifications" section contains the detailed technical description of conditions prohibiting the required testing of safety-related pumps and an alternate test method to be performed during cold shutdowns. Beaver Valley Unit 2 reactor containment is maintained subatmospheric as required by technical specifications. The subatmospheric condition presents a hazardous working environment for station personnel and is considered inaccessible for surveillance testing. Surveillance testing that requires a reactor containment entry will be performed at cold shutdown and refueling. The pump cold shutdown justification(s) for a specific pump are referenced by the number(s) listed on the pump's outline sheets.

The "Pump Refueling Outage Justifications" section contains the detailed technical description of conditions prohibiting the required testing of safety-related pumps and an alternate test method to be performed during refueling outages. The pump refueling outage justification(s) for a specific pump are referenced by the number(s) listed on the pump's outline sheets.

The "Pump Relief Requests" section contains the detailed technical description of particular conditions and equipment installations prohibiting the testing of some of the characteristics of safety-related pumps. An alternate test method and the frequency of revised testing is also included to meet the intent of 10CFR50.55a. The relief request(s) for a specific pump is referenced by the number(s) listed on the pump's testing outline sheet.

The "Pump Minimum Operating Point (MOP) Curves" section contains a graphical representation of the minimum allowable pump flow versus head, which is required to meet the applicable safety analysis, for each centrifugal pump in the Unit 2 IST Program.

SECTION II: PUMP OUTLINES

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21A Charging Pump	**Pump Number:** 2CHS*P21A	**Code Class:** 2	**System:** 7-Chemical and Volume Control

Function: To provide normal RCS inventory makeup, seal injection and high head safety injection.	**Type:** Centrifugal	**Dwg. OM No.:** 7-1A **Dwg. Coord.:** C-4

Remarks: Pump is tested quarterly on recirculation flow and at full flow during refueling outages. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	7.4 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CHS-PI151B] and Pump Suction Pressure Indicator [2CHS-PI151A], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CHS-PI151A].
	11.14B (R)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CHS-PI151B] and Pump Suction Pressure Indicator [2CHS-PI151A], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CHS-PI151A].
Q	7.4 (Q)	X	Summation of flow rates from Flow Indicators [2CHS-FI122A, 124A, 127A, 130A, 160], Control Room, and [2CHS-FI170], local.
	11.14B (R)	X	Summation of flow rates from Flow Indicators [2SIS-FI975, 976, 977], local.
V	7.4 (Q)	X	Portable monitoring equipment using velocity units.
	11.14B (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21B Charging Pump	**Pump Number:** 2CHS*P21B	**Code Class:** 2	**System:** 7-Chemical and Volume Control

Function: To provide normal RCS inventory makeup, seal injection and high head safety injection.	**Type:** Centrifugal	**Dwg. OM No.:** 7-1A
		Dwg. Coord.: D-4

Remarks: Pump is tested quarterly on recirculation flow and at full flow during refueling outages. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	7.5 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CHS-PI152B] and Pump Suction Pressure Indicator [2CHS-PI152A], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CHS-PI152A].
	11.14B (R)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CHS-PI152B] and Pump Suction Pressure Indicator [2CHS-PI152A], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CHS-PI152A].
Q	7.5 (Q)	X	Summation of flow rates from Flow Indicators [2CHS-FI122A, 124A, 127A, 130A, 160], Control Room, and [2CHS-FI170], local.
	11.14B (R)	X	Summation of flow rates from Flow Indicators [2SIS-FI981, 982, 983], local.
V	7.5 (Q)	X	Portable monitoring equipment using velocity units.
	11.14B (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21C Charging Pump	**Pump Number:** 2CHS*P21C	**Code Class:** 2	**System:** 7-Chemical and Volume Control
Function: To provide normal RCS inventory makeup, seal injection and high head safety injection.		**Type:** Centrifugal	**Dwg. OM No.:** 7-1A **Dwg. Coord.:** E-4
Remarks: Pump is tested quarterly on recirculation flow and at full flow during refueling outages. Also see PRR1 and PRR2.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	7.6 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CHS-PI153B] and Pump Suction Pressure Indicator [2CHS-PI153A], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CHS-PI153A].
	11.14B (R)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CHS-PI153B] and Pump Suction Pressure Indicator [2CHS-PI153A], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CHS-PI153A].
Q	7.6 (Q)	X	Summation of flow rates from Flow Indicators [2CHS-FI122A, 124A, 127A, 130A, 160], Control Room, and [2CHS-FI170], local.
	11.14B (R)	X	Summation of flow rates from Flow Indicators [2SIS-FI971, 972, 973], local.
V	7.6 (Q)	X	Portable monitoring equipment using velocity units.
	11.14B (R)	X	Portable monitoring equipment using velocity units.

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PUMP OUTLINE

Pump Name: 22A Boric Acid Transfer Pump	**Pump Number:** 2CHS*P22A	**Code Class:** 3	**System:** 7-Chemical and Volume Control
Function: Chemical shim and emergency boration supply.		**Type:** Centrifugal	**Dwg. OM No.:** 7-2 **Dwg. Coord.:** C-2
Remarks: Pump is tested quarterly at full flow by recirculating the Boric Acid Tank. Also see PRR1 and PRR2.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	7.1 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CHS-PI105] and Pump Suction Pressure Indicator [2CHS-PI123A], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CHS-PI123A].
Q	7.1 (Q)	X	Flow Indicator [2CHS-FI123A(B)], local.
V	7.1 (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 22B Boric Acid Transfer Pump	**Pump Number:** 2CHS*P22B	**Code Class:** 3	**System:** 7-Chemical and Volume Control
Function: Chemical shim and emergency boration supply.		**Type:** Centrifugal	**Dwg. OM No.:** 7-2 **Dwg. Coord.:** F-2
Remarks: Pump is tested quarterly at full flow by recirculating the Boric Acid Tank. Also see PRR1 and PRR2.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	7.2 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CHS-PI110] and Pump Suction Pressure Indicator [2CHS-PI123B], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CHS-PI123B].
Q	7.2 (Q)	X	Flow Indicator [2CHS-FI123B(A)], local.
V	7.2 (Q)	X	Portable monitoring equipment using velocity units.

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PUMP OUTLINE

Pump Name: 21A Residual Heat Removal Pump	**Pump Number:** 2RHS*P21A	**Code Class:** 2	**System:** 10-Residual Heat Removal

Function: Long term decay heat removal.	**Type:** Vertical Centrifugal	**Dwg. OM No.:** 10-1 **Dwg. Coord.:** B-3

Remarks: Pump is tested quarterly at full flow during cold shutdowns and refueling outages per PCSJ1. Also see PRR1.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	10.1 (CSD,R)	X	Calculated using Pump Discharge Pressure Indicator [2RHS-PI602A] and Pump Suction Pressure Indicator [2RHS-PI603A], Control Room.
Q	10.1 (CSD,R)	X	Summation of flow rates from Flow Indicators [2RHS-FI607A], [2RHS-FI605A], and [2CHS-FI150], Control Room.
V	10.1 (CSD,R)	X	Portable monitoring equipment using velocity units. Motor bearing vibrations will be obtained because the pump bearings are in the driver.

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PUMP OUTLINE

Pump Name: 21B Residual Heat Removal Pump	**Pump Number:** 2RHS*P21B	**Code Class:** 2	**System:** 10-Residual Heat Removal

Function: Long term decay heat removal.	**Type:** Vertical Centrifugal	**Dwg. OM No.:** 10-1 **Dwg. Coord.:** E-3

Remarks: Pump is tested quarterly at full flow during cold shutdowns and refueling outages per PCSJ1. Also see PRR1.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	10.2 (CSD,R)	X	Calculated using Pump Discharge Pressure Indicator [2RHS-PI602B] and Pump Suction Pressure Indicator [2RHS-PI603B], Control Room.
Q	10.2 (CSD,R)	X	Summation of flow rates from Flow Indicators [2RHS-FI607B], [2RHS-FI605B], and [2CHS-FI150], Control Room.
V	10.2 (CSD,R)	X	Portable monitoring equipment using velocity units. Motor bearing vibrations will be obtained because the pump bearings are in the driver.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21A Low Head Safety Injection Pump	**Pump Number:** 2SIS*P21A	**Code Class:** 2	**System:** 11-Safety Injection

Function: Low pressure - high volume safety injection.	**Type:** Centrifugal	**Dwg. OM No.:** 11-1 **Dwg. Coord.:** E-2

Remarks: Pump is tested quarterly on recirculation flow and at full flow during refueling outages. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	11.1 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2SIS-PI943] and Pump Suction Pressure Indicator [2SIS-PI938], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2SIS-PI938].
	11.14A (R)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2SIS-PI943] and Pump Suction Pressure Indicator [2SIS-PI938], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2SIS-PI938].
Q	11.1 (Q)	X	Flow indicator [2SIS-FIS970A], local.
	11.14A (R)	X	Flow indicator [2SIS-FI945], Control Room.
V	11.1 (Q)	X	Portable monitoring equipment using velocity units.
	11.14A (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21B Low Head Safety Injection Pump	**Pump Number:** 2SIS*P21B	**Code Class:** 2	**System:** 11-Safety Injection
Function: Low pressure - high volume safety injection.		**Type:** Centrifugal	**Dwg. OM No.:** 11-1 **Dwg. Coord.:** G-2
Remarks: Pump is tested quarterly on recirculation flow and at full flow during refueling outages. Also see PRR1 and PRR2.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	11.2 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2SIS-PI944] and Pump Suction Pressure Indicator [2SIS-PI939], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2SIS-PI939].
	11.14A (R)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2SIS-PI944] and Pump Suction Pressure Indicator [2SIS-PI939], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2SIS-PI939].
Q	11.2 (Q)	X	Flow indicator [2SIS-FIS970B], local.
	11.14A (R)	X	Flow indicator [2SIS-FI946], Control Room.
V	11.2 (Q)	X	Portable monitoring equipment using velocity units.
	11.14A (R)	X	Portable monitoring equipment using velocity units.

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PUMP OUTLINE

Pump Name: 21A Quench Spray Pump	**Pump Number:** 2QSS*P21A	**Code Class:** 2	**System:** 13-Containment Depressurization

Function: To provide borated water from the RWST to the containment spray header for containment depressurization following a DBA.	**Type:** Centrifugal	**Dwg. OM No.:** 13-2 **Dwg. Coord.:** A-9

Remarks: Pump is tested quarterly at full flow by recirculating the RWST. Also see PRR1.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	13.1 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2QSS-PI101A] and Pump Suction Pressure Indicator [2QSS-PI102A], Control Room.
Q	13.1 (Q)	X	Flow Indicator [2QSS-FIS101A or 102A], local.
V	13.1 (Q)	X	Portable monitoring equipment using velocity units.

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PUMP OUTLINE

Pump Name: 21B Quench Spray Pump	**Pump Number:** 2QSS*P21B	**Code Class:** 2	**System:** 13-Containment Depressurization
Function: To provide borated water from the RWST to the containment spray header for containment depressurization following a DBA.		**Type:** Centrifugal	**Dwg. OM No.:** 13-2 **Dwg. Coord.:** G-9
Remarks: Pump is tested quarterly at full flow by recirculating the RWST. Also see PRR1.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	13.2 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2QSS-PI101B] and Pump Suction Pressure Indicator [2QSS-PI102B], Control Room.
Q	13.2 (Q)	X	Flow Indicator [2QSS-FIS101B or 102B], local.
V	13.2 (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 24A Chemical Injection Pump	**Pump Number:** 2QSS*P24A	**Code Class:** 2	**System:** 13-Containment Depressurization
Function: Chemical injection to the Quench Spray System during containment depressurization.		**Type:** Positive Displacement	**Dwg. OM No.:** 13-2 **Dwg. Coord.:** C-6
Remarks: Pump is tested quarterly at full flow by recirculating the RWST. Also see PRR1.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
P	13.10A (Q)	X	Pump Discharge Pressure Indicator [2QSS-PI111A], local.
Q	13.10A (Q)	X	Flow Indicator [2QSS-FIS105A], local.
V	13.10A (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 24B Chemical Injection Pump	**Pump Number:** 2QSS*P24B	**Code Class:** 2	**System:** 13-Containment Depressurization

Function: Chemical injection to the Quench Spray System during containment depressurization.	**Type:** Positive Displacement	**Dwg. OM No.:** 13-2 **Dwg. Coord.:** E-6

Remarks: Pump is tested quarterly at full flow by recirculating the RWST. Also see PRR1.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
P	13.10B (Q)	X	Pump Discharge Pressure Indicator [2QSS-PI111B], local.
Q	13.10B (Q)	X	Flow Indicator [2QSS-FIS105B], local.
V	13.10B (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21A Recirculation Spray Pump	**Pump Number:** 2RSS*P21A	**Code Class:** 2	**System:** 13-Containment Depressurization

Function: Circulate containment sump water for long term containment depressurization.	**Type:** Vertical	**Dwg. OM No.:** 13-1 **Dwg. Coord.:** F-3

Remarks: Pump is normally tested during refueling outages at full flow through a test loop per PROJ1. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	2BVT 1.13.5 (2 YR)	X (PRR2)	Calculated using a local temporary discharge pressure test gauge, and a local temporary suction pressure test gauge. See PRR2 for range and accuracy of temporary suction pressure test gauge.
Q	2BVT 1.13.5 (2 YR)	X	Flow Indicator [2RSS-FI157A], Control Room.
V	2BVT 1.13.5 (2 YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21B Recirculation Spray Pump	**Pump Number:** 2RSS*P21B	**Code Class:** 2	**System:** 13-Containment Depressurization

Function: Circulate containment sump water for long term containment depressurization.	**Type:** Vertical	**Dwg. OM No.:** 13-1 **Dwg. Coord.:** E-8

Remarks: Pump is normally tested during refueling outages at full flow through a test loop per PROJ1. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	2BVT 1.13.5 (2 YR)	X (PRR2)	Calculated using a local temporary discharge pressure test gauge, and a local temporary suction pressure test gauge. See PRR2 for range and accuracy of temporary suction pressure test gauge.
Q	2BVT 1.13.5 (2 YR)	X	Flow Indicator [2RSS-FI157B], Control Room.
V	2BVT 1.13.5 (2 YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21C Recirculation Spray Pump	**Pump Number:** 2RSS*P21C	**Code Class:** 2	**System:** 13-Containment Depressurization

Function: Circulate containment sump water for long term containment depressurization and long term core recirculation.	**Type:** Vertical	**Dwg. OM No.:** 13-1 **Dwg. Coord.:** E-5

Remarks: Pump is normally tested during refueling outages at full flow through a test loop per PROJ1. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	2BVT 1.13.5 (2 YR)	X (PRR2)	Calculated using a local temporary discharge pressure test gauge, and local temporary suction pressure test gauge. See PRR2 for range and accuracy of temporary suction pressure test gauge.
Q	2BVT 1.13.5 (2 YR)	X	Flow Indicator [2RSS-FI157C], Control Room.
V	2BVT 1.13.5 (2 YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21D Recirculation Spray Pump	**Pump Number:** 2RSS*P21D	**Code Class:** 2	**System:** 13-Containment Depressurization

Function: Circulate containment sump water for long term containment depressurization and long term core recirculation.	**Type:** Vertical	**Dwg. OM No.:** 13-1 **Dwg. Coord.:** E-6

Remarks: Pump is normally tested during refueling outages at full flow through a test loop per PROJ1. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	2BVT 1.13.5 (2 YR)	X (PRR2)	Calculated using a local temporary discharge pressure test gauge, and local temporary suction pressure test gauge. See PRR2 for range and accuracy of temporary suction pressure test gauge.
Q	2BVT 1.13.5 (2 YR)	X	Flow Indicator [2RSS-FI157D], Control Room.
V	2BVT 1.13.5 (2 YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21A Component Cooling Water Pump	**Pump Number:** 2CCP*P21A	**Code Class:** 3	**System:** 15-Primary Component Cooling Water
Function: Provide cooling water to Residual Heat Removal Heat Exchangers and reactor plant components.		**Type:** Centrifugal	**Dwg. OM No.:** 15-1 **Dwg. Coord.:** B-4
Remarks: Pump is tested quarterly using a pump curve per PRR3. Also see PRR1 and PRR2.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	15.1 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CCP-PI145A], Control Room, and Pump Suction Pressure Indicator [2CCP-PI150A], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CCP-PI150A].
Q	15.1 (Q)	X	Flow Indicator [2CCP-FI117A1], Control Room.
V	15.1 (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21B Component Cooling Water Pump	**Pump Number:** 2CCP*P21B	**Code Class:** 3	**System:** 15-Primary Component Cooling Water
Function: Provide cooling water to Residual Heat Removal Heat Exchangers and reactor plant components.		**Type:** Centrifugal	**Dwg. OM No.:** 15-1 **Dwg. Coord.:** F-4
Remarks: Pump is tested quarterly using a pump curve per PRR3. Also see PRR1 and PRR2.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	15.2 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CCP-PI145B], Control Room, and Pump Suction Pressure Indicator [2CCP-PI150B], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CCP-PI150B].
Q	15.2 (Q)	X	Summation of flow rates from Flow Indicators [2CCP-FI117B1], Control Room, [2CCP-FI103] and [2CCP-FI102], local.
V	15.2 (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21C Component Cooling Water Pump	**Pump Number:** 2CCP*P21C	**Code Class:** 3	**System:** 15-Primary Component Cooling Water

Function: Provide cooling water to Residual Heat Removal Heat Exchangers and reactor plant components.	**Type:** Centrifugal	**Dwg. OM No.:** 15-1 **Dwg. Coord.:** D-4

Remarks: Pump is tested quarterly using a pump curve per PRR3. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	15.3 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2CCP-PI145C], Control Room, and Pump Suction Pressure Indicator [2CCP-PI150C], local. See PRR2 for range and accuracy of Pump Suction Pressure Indicator [2CCP-PI150C].
Q	15.3 (Q)	X	Flow Indicator [2CCP-FI117A1], Control Room OR summation of flow rates from Flow Indicators [2CCP-FI117B1], Control Room, [2CCP-FI103] and [2CCP-FI102], local.
V	15.3 (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: Turbine Driven Auxiliary Feedwater Pump	**Pump Number:** 2FWE*P22	**Code Class:** 3	**System:** 24-Auxiliary Feedwater

Function: Provide emergency makeup to Steam Generators during loss of normal feedwater.	**Type:** Centrifugal	**Dwg. OM No.:** 24-3 **Dwg. Coord.:** E-4

Remarks: Pump is tested quarterly (on a staggered test basis) on recirculation flow and at full flow when in Mode 3 during startup from refueling outages. It will also be tested at full flow when in Mode 3 during startup from a cold shutdown, if associated check valves are also tested, or if the pump is on double frequency testing in accordance with Paragraph 6.1 of OM-6. Also see PRR1.

Parameter	2OST-(Frequency)	Req'd	Comments
N	24.4 (Q)	X	No installed rpm indication. Use portable monitoring equipment - Stroboscope.
	24.4 (CSD,R)	X	No installed rpm indication. Use portable monitoring equipment - Stroboscope.
ΔP	24.4 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155] and Pump Suction Pressure Indicator [2FWE-PI156], local.
	24.4 (CSD,R)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155] and Pump Suction Pressure Indicator [2FWE-PI156], local.
Q	24.4 (Q)	X	Flow Indicator [2FWE-FI155], local.
	24.4 (CSD,R)	X	Summation of flow rates from Flow Indicators [2FWE-FI100A,B,C], Control Room.
V	24.4 (Q)	X	Portable monitoring equipment using velocity units.
	24.4 (CSD,R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 23A Motor Driven Auxiliary Feedwater Pump	**Pump Number:** 2FWE*P23A	**Code Class:** 3	**System:** 24-Auxiliary Feedwater

Function: Provide emergency makeup to Steam Generators during loss of normal feedwater.	**Type:** Centrifugal	**Dwg. OM No.:** 24-3 **Dwg. Coord.:** F-4

Remarks: Pump is tested quarterly (on a staggered test basis) on recirculation flow and at full flow during refueling outages. It will also be tested at full flow during cold shutdown, if associated check valves are also tested, or if the pump is on double frequency testing in accordance with Paragraph 6.1 of OM-6. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	24.2 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155A] and Pump Suction Pressure Indicator [2FWE-PI156A], local.
	24.6 (CSD,R)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155A] and Pump Suction Pressure Indicator [2FWE-PI156A], local.
Q	24.2 (Q)	X	Flow Indicator [2FWE-FI155A], local.
	24.6 (CSD,R)	X (PRR2)	Summation of flow rates from Flow Indicators [2FWE-FI100A,B,C], Control Room. See PRR2 for range and accuracy of Flow Indicators [2FWE-FI100A,B,C].
V	24.2 (Q)	X	Portable monitoring equipment using velocity units.
	24.6 (CSD,R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 23B Motor Driven Auxiliary Feedwater Pump	**Pump Number:** 2FWE*P23B	**Code Class:** 3	**System:** 24-Auxiliary Feedwater

Function: Provide emergency makeup to Steam Generators during loss of normal feedwater.	**Type:** Centrifugal	**Dwg. OM No.:** 24-3 **Dwg. Coord.:** G-4

Remarks: Pump is tested quarterly (on a staggered test basis) on recirculation flow and at full flow during refueling outages. It will also be tested at full flow during cold shutdown, if associated check valves are also tested, or if the pump is on double frequency testing in accordance with Paragraph 6.1 of OM-6. Also see PRR1 and PRR2.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	24.3 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155B] and Pump Suction Pressure Indicator [2FWE-PI156B], local.
	24.6 (CSD,R)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155B] and Pump Suction Pressure Indicator [2FWE-PI156B], local.
Q	24.3 (Q)	X	Flow Indicator [2FWE-FI155B], local.
	24.6 (CSD,R)	X (PRR2)	Summation of flow rates from Flow Indicators [2FWE-FI100A,B,C], Control Room. See PRR2 for range and accuracy of Flow Indicators [2FWE-FI100A,B,C].
V	24.3 (Q)	X	Portable monitoring equipment using velocity units.
	24.6 (CSD,R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21A Service Water Pump	**Pump Number:** 2SWS*P21A	**Code Class:** 3	**System:** 30-Service Water

Function: Provide cooling water to Recirculation Spray Heat Exchangers and reactor plant components under normal and emergency conditions.	**Type:** Vertical	**Dwg. OM No.:** 30-1 **Dwg. Coord.:** C-2

Remarks: Pump is tested quarterly using a pump curve per PRR4. Also see PRR1 and PRR5.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	30.2 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101A] and river water elevation from Ohio River Level Recorder [LR-1CW-101], local, as permitted by NUREG-1482, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure".
Q	30.2 (Q)	X	Flow Indicator [2SWS-FIT100], local.
V	30.2 (Q)	X (PRR5)	Portable monitoring equipment using velocity units. The motor outboard axial (MOA) vibration measurement is not accessible and will not be obtained per PRR5.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21B Service Water Pump	**Pump Number:** 2SWS*P21B	**Code Class:** 3	**System:** 30-Service Water

Function: Provide cooling water to Recirculation Spray Heat Exchangers and reactor plant components under normal and emergency conditions.	**Type:** Vertical	**Dwg. OM No.:** 30-1 **Dwg. Coord.:** D-2

Remarks: Pump is tested quarterly using a pump curve per PRR4. Also see PRR1 and PRR5.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	30.3 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101B] and river water elevation from Ohio River Level Recorder [LR-1CW-101], local, as permitted by NUREG-1482, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure".
Q	30.3 (Q)	X	Flow Indicator [2SWS-FIT100S], local.
V	30.3 (Q)	X (PRR5)	Portable monitoring equipment using velocity units. The motor outboard axial (MOA) vibration measurement is not accessible and will not be obtained per PRR5.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21C Service Water Pump	**Pump Number:** 2SWS*P21C	**Code Class:** 3	**System:** 30-Service Water

Function: Provide cooling water to Recirculation Spray Heat Exchangers and reactor plant components under normal and emergency conditions.	**Type:** Vertical	**Dwg. OM No.:** 30-1 **Dwg. Coord.:** G-2

Remarks: Pump is tested quarterly using a pump curve per PRR4. Also see PRR1 and PRR5.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	30.6 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101C] and river water elevation from Ohio River Level Recorder [LR-1CW-101], local, as permitted by NUREG-1482, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure".
Q	30.6 (Q)	X	Flow Indicator [2SWS-FIT100(S)], local.
V	30.6 (Q)	X (PRR5)	Portable monitoring equipment using velocity units. The motor outboard axial (MOA) vibration measurement is not accessible and will not be obtained per PRR5.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21A Fuel Oil Transfer Pump	**Pump Number:** 2EGF*P21A	**Code Class:** 3	**System:** 36-Diesel Fuel Oil
Function: Transfer fuel from the underground storage tank to the day tank.		**Type:** Vertical	**Dwg. OM No.:** 36-1 **Dwg. Coord.:** F-3
Remarks: Pump is normally tested bi-monthly at full flow from the storage tank to the day tank. Also see PRR1, PRR2 and PRR6.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.1 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2EGF-PI201A] and Fuel Oil Storage Tank level from [2EGF-LIS201A], local, as permitted by NUREG-1482, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure." See PRR2 for range and accuracy of Pump Discharge Pressure Indicator [2EGF-PI201A].
Q	36.1 (Q)	X (PRR6)	No instrumentation is provided for flow. A level change over time in the day tank will be measured using Level Gauge [2EGF*LG201], local, and converted to flowrate per PRR6.
V	36.1 (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21B Fuel Oil Transfer Pump	**Pump Number:** 2EGF*P21B	**Code Class:** 3	**System:** 36-Diesel Fuel Oil

Function: Transfer fuel from the underground storage tank to the day tank.	**Type:** Vertical	**Dwg. OM No.:** 36-1 **Dwg. Coord.:** E-3

Remarks: Pump is normally tested bi-monthly at full flow from the storage tank to the day tank. Also see PRR1, PRR2 and PRR6.

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.1 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2EGF-PI201B] and Fuel Oil Storage Tank level from [2EGF-LIS201A], local, as permitted by NUREG-1482, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure." See PRR2 for range and accuracy of Pump Discharge Pressure Indicator [2EGF-PI201B].
Q	36.1 (Q)	X (PRR6)	No instrumentation is provided for flow. A level change over time in the day tank will be measured using Level Gauge [2EGF*LG201], local, and converted to flowrate per PRR6.
V	36.1 (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21C Fuel Oil Transfer Pump	**Pump Number:** 2EGF*P21C	**Code Class:** 3	**System:** 36-Diesel Fuel Oil
Function: Transfer fuel from the underground storage tank to the day tank.		**Type:** Vertical	**Dwg. OM No.:** 36-1 **Dwg. Coord.:** F-8
Remarks: Pump is normally tested bi-monthly at full flow from the storage tank to the day tank. Also see PRR1, PRR2 and PRR6.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.2 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2EGF-PI201C] and Fuel Oil Storage Tank level from [2EGF-LIS201B], local, as permitted by NUREG-1482, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure." See PRR2 for range and accuracy of Pump Discharge Pressure Indicator [2EGF-PI201C].
Q	36.2 (Q)	X (PRR6)	No instrumentation is provided for flow. A level change over time in the day tank will be measured using Level Gauge [2EGF*LG202], local, and converted to flowrate per PRR6.
V	36.2 (Q)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE

Pump Name: 21D Fuel Oil Transfer Pump	**Pump Number:** 2EGF*P21D	**Code Class:** 3	**System:** 36-Diesel Fuel Oil
Function: Transfer fuel from the underground storage tank to the day tank.		**Type:** Vertical	**Dwg. OM No.:** 36-1 **Dwg. Coord.:** E-8
Remarks: Pump is normally tested bi-monthly at full flow from the storage tank to the day tank. Also see PRR1, PRR2 and PRR6.			

Parameter	2OST-(Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.2 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2EGF-PI201D] and Fuel Oil Storage Tank level from [2EGF-LIS201B], local, as permitted by NUREG-1482, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure." See PRR2 for range and accuracy of Pump Discharge Pressure Indicator [2EGF-PI201D].
Q	36.2 (Q)	X (PRR6)	No instrumentation is provided for flow. A level change over time in the day tank will be measured using Level Gauge [2EGF*LG202], local, and converted to flowrate per PRR6.
V	36.2 (Q)	X	Portable monitoring equipment using velocity units.

SECTION III: PUMP COLD SHUTDOWN JUSTIFICATIONS

PUMP COLD SHUTDOWN JUSTIFICATION 1

Pump Mark No(s): 2RHS*P21A
2RHS*P21B

Code Class: 2

System: 10 - Residual Heat Removal

Function: To provide long term removal of decay heat from the reactor core and sensible heat from the RCS in order to achieve and maintain the plant in a cold shutdown condition.

Test Requirement: Per OM-6, Paragraph 5.1, "Frequency of Inservice Tests", an inservice test shall be run on each pump, nominally every 3 months.

Basis for CSJ: These pumps are not required to be run at power and are considered out of service. They are not returned to service until RCS temperature is ≤350F and RCS pressure is ≤360 psig. Per OM-6, Paragraph 5.4, "Pumps in Systems Out of Service", the test schedule need not be followed for pumps in a system not required to be operable.

In addition, these pumps are located inside containment. If tested at power, test personnel would have to make a containment entry to properly monitor pump operation. However, Beaver Valley Unit 2 reactor containment is maintained subatmospheric as required by technical specifications. The subatmospheric condition presents a hazardous working environment for station personnel and is considered inaccessible for surveillance testing.

Alternate Test: These pumps will be tested quarterly at full flow only during cold shutdowns and refueling outages per 2OST-10.1 and 2OST-10.2 (Residual Heat Removal Pump Performance Tests).

References: OM-6, Paragraphs 5.1 and 5.4.

SECTION IV: PUMP REFUELING OUTAGE JUSTIFICATIONS

PUMP REFUELING OUTAGE JUSTIFICATION 1

Pump Mark No(s): 2RSS*P21A
2RSS*P21B
2RSS*P21C
2RSS*P21D

Code Class: 2

System: 13 - Containment Depressurization

Function: To circulate water from the reactor containment sump to the spray rings at the top of the containment dome for the purpose of removing heat from the containment atmosphere thereby depressing and holding containment pressure subatmospheric for the long term following a DBA. In addition, the "C" and "D" Recirculation Spray Pumps also take suction from the containment sump to provide water to the High Head Safety Injection Pumps for long term core recirculation.

Test Requirement: Per OM-6, Paragraph 5.1, "Frequency of Inservice Tests", an inservice test shall be run on each pump, nominally every 3 months.

Basis for ROJ: These vertical suction well centrifugal pumps are located outside of containment in the safeguards building, but take suction from the containment sump. They are not operated during normal plant operation and are maintained in a "dry" layup condition between refueling outages along with their associated heat exchangers. The only time that water is introduced to the suction of these pumps is for testing purposes and following an accident resulting in a containment isolation phase B signal, when the pumps start after an approximately 628 second time delay to allow for the containment sump to be filled by the Quench Spray System and any primary plant leakage. In order to test these pumps, a temporary dike must be erected inside reactor containment around the containment sump with enough water added to ensure an adequate NPSH for each pump. Per OM-6, Paragraph 5.5, "Pumps Lacking Required Fluid Inventory", pumps in dry sumps need not be tested every 3 months, however, they shall be tested at least once every 2 years with the required fluid inventory provided during this test.

Alternate Test: These pumps will be tested at full flow once during each refueling outage per 2BVT 1.13.5 (Recirculation Spray Pump Test).

References: OM-6, Paragraphs 5.1 and 5.5.

SECTION V: PUMP RELIEF REQUESTS

PUMP RELIEF REQUEST 1

Pump Mark No(s): All of the pumps in the IST Program. **Code Class:** 2, 3

System: Various

Function: Various

Test Requirement: Per OM-6, Paragraph 6, "Analyses and Evaluation", if deviations fall within the alert range of Table 3a for vibrations, the frequency of testing specified in Paragraph 5.1, shall be doubled until the cause of the deviation is determined and the condition corrected.

Basis for Relief: In accordance with 10CFR50.55a(a)(3)(i), relief is requested on the basis that the proposed alternatives would provide an acceptable level of quality and safety.

The ASME OMc Code-1994, Subsection ISTB, Paragraph 4.6, "New Reference Values," states in cases where a pump's test parameters are within the alert or required action ranges and the pump's continued use at the changed values is supported by an analysis, a new set of reference values may be established. Paragraph 4.6 goes on to say that this analysis shall include verification of the pump's operational readiness. The analysis shall also include both a pump level and system level evaluation of operational readiness, the cause of the change in pump performance, and an evaluation of all trends indicated by available data. The results of this analysis shall be documented in the record of tests.

Spectral analysis may be used to determine the mechanical condition of a pump. The reason for testing a pump on double frequency is to obtain additional information so that the condition of the pump may be determined. Spectral data can provide information to determine if misalignment, unbalance, resonance, looseness or a bearing problem is present. Through a review of the spectral data over a period of time, any change in condition of the pump may also be determined.

PUMP RELIEF REQUEST 1

Alternate Test:

BVPS-2 proposes to implement ASME OMc Code-1994, Subsection ISTB, Paragraph 4.6 for vibration measurements for all of the pumps in the IST Program. Spectral vibration data is currently being obtained for each vibration measurement on all of the pumps. Each time a pump enters the alert range for vibration, an analysis of the spectral vibration data will be performed to determine the cause of the higher vibrations. If the analysis supports continued operation, the pump will be removed from double frequency testing and a new set of reference valves may be obtained. However, to avoid stair-stepping to failure, a new set of reference values may only be obtained once prior to performing corrective maintenance. If the cause of the higher vibrations cannot be determined, or if the data shows a continuing trend such that the condition of the pump may continue to degrade until it can no longer fulfill its function, the pump will remain on double frequency testing until the condition is corrected.

References:

OM-6, Paragraphs 5.1 and 6, and Table 3.
ISTB, Paragraph 4.6.

PUMP RELIEF REQUEST 2

Pump Mark No(s): See the attached Table. **Code Class:** 2, 3

System: Various

Function: Various

Test Requirement: Per OM-6, Paragraph 4.6.1.2(a), "Range", the full-scale range of each analog instrument shall be not greater than three times the reference value.

Basis for Relief: In accordance with 10CFR50.55a(a)(3)(i), relief is requested on the basis that the proposed alternatives would provide an acceptable level of quality and safety.

The pumps listed on the attached table use instruments which do not meet the requirements of OM-6, Paragraph 4.6.1.2(a), however, the accuracy of the instruments used is more conservative than the requirements of OM-6, Paragraph 4.6.1.1, "Quality", and Table 1, "Acceptable Instrument Accuracy". Per the attached table, the combination of higher range and better accuracy for each instrument yields a reading at least equivalent to the reading achieved from instruments that meet OM-6, Paragraph 4.6.1.1 and Table 1 requirements. Therefore, relief is requested in accordance with NUREG-1482, Section 5.5.1, "Range and Accuracy of Analog Instruments".

Alternate Test: Use the instruments listed on the attached table as long as the combination of the higher range and better accuracy for each instrument yields a reading at least equivalent to the reading achieved from instruments that meet OM-6 requirements.

References: OM-6, Paragraphs 4.6.1.1 and 4.6.1.2(a), and Table 1. NUREG-1482, Section 5.5.1.

PUMP RELIEF REQUEST 2

IST PUMP INSTRUMENTATION			
Pump ID#	**Instrument ID#**	**Condition Requiring Relief**	**Basis for Relief/Alternate Test**
2CHS*P21A 2CHS*P21B 2CHS*P21C	2CHS-PI151A 2CHS-PI152A 2CHS-PI153A	The range of the gauges is greater than three times the reference pressures during quarterly recirculation flow testing and during full flow testing at refueling.	These gauges are the suction pressure gauges for the Charging Pumps. They are sized for all modes of pump operation including accident conditions (i.e., can take suction from the Recirculation Spray Pumps) with a range of 0-160 psig. During recirculation flow testing, the suction pressures are approx. 25% of the range. During full flow testing, the suction pressures are approx. 10% of the range. Their calibration accuracy is 0.5%, which would yield a reading more accurate than OM-6 requirements.
2CHS*P22A 2CHS*P22B	2CHS-PI123A 2CHS-PI123B	The range of the gauges is greater than three times the reference pressures during quarterly testing.	These gauges are the suction pressure gauges for the Boric Acid Transfer Pumps. They are sized for all modes of pump operation and Boric Acid Storage Tank levels with a range of 0-30 psig. During quarterly testing, the suction pressures are approx. 10-15% of the range. Their calibration accuracy is 0.5%, which would yield a reading more accurate than OM-6 requirements.
2SIS*P21A 2SIS*P21B	2SIS-PI938 2SIS-PI939	The range of the gauges is greater than three times the reference pressures during quarterly recirculation flow testing and during full flow testing at refueling.	These gauges are the suction pressure gauges for the Low Head Safety Injection Pumps. They are sized for recirculation and full flow testing with a range of 0-160 psig. During recirculation flow testing, the suction pressures are approx. 20% of the range. During full flow testing, the suction pressures are approx. 10% of the range. Their calibration accuracy is 0.5%, which would yield a reading more accurate than OM-6 requirements.
2RSS*P21A 2RSS*P21B 2RSS*P21C 2RSS*P21D	Test Gauges (Suction Pressure)	The range of the gauges may be greater than three times the reference pressures during testing at refueling.	A test gauge is installed on the suction line of each Recirculation Spray Pump during testing at refueling. A test dam is erected and filled with water to provide NPSH. The gauges are sized for varying levels of water in the test dam with suction pressures varying typically between 20-30 IWC. Test gauges of varying ranges and accuracies may be used; however, the combination of range and accuracy would yield a pressure reading within $\pm$ 1.2 IWC. Therefore, their better calibration with a larger range would yield a reading more accurate than OM-6 requirements.
2CCP*P21A 2CCP*P21B 2CCP*P21C	2CCP-PI150A 2CCP-PI150B 2CCP-PI150C	The range of the gauges is greater than three times the reference pressures during quarterly testing.	These are the suction pressure gauges for the Component Cooling Water Pumps. They are sized for all modes of pump operation with a range of 0-60 psig. A pump curve is used during quarterly testing as approved by Pump Relief Request No. 3. The suction pressures vary between 24-37% of the range. Their calibration accuracy is 0.5%, which would yield a reading more accurate than OM-6 requirements.

PUMP RELIEF REQUEST 2

IST PUMP INSTRUMENTATION			
Pump ID#	**Instrument ID#**	**Condition Requiring Relief**	**Basis for Relief/Alternate Test**
2FWE*P23A 2FWE*P23B	2FWE-FI100A 2FWE-FI100B 2FWE-FI100C	The range of the gauges is greater than three times the reference flows during full flow testing at cold shutdown and refueling.	These flow meters are located in the three lines to the Steam Generators from the Auxiliary Feedwater (AFW) Pumps. They are each sized with a range of 0-400 gpm to measure accident flows from the Turbine-Driven AFW Pump [2FWE*P22]. They are also used to measure accident flows from the Motor-Driven AFW Pumps [2FWE*P23A and B], but at a lesser flow rate of approx. 30% of the range. Their calibration accuracy is 1.5%, which would yield a reading more accurate than OM-6 requirements.
2EGF*P21A 2EGF*P21B 2EGF*P21C 2EGF*P21D	2EGF-PI201A 2EGF-PI201B 2EGF-PI201C 2EGF-PI201D	The range of the gauges is greater than three times the reference pressures during bi-monthly testing.	These are the discharge pressure gauges for the Emergency Diesel Generator Fuel Oil Transfer Pumps. They are sized for all modes of pump operation with a range of 0-30 psig. During bi-monthly testing, discharge pressures are between 8.5 and 10.5 psig, slightly below 1/3 of the range. Their calibration accuracy is 1.0%, which would yield a reading more accurate than OM-6 requirements.

PUMP RELIEF REQUEST 3

Pump Mark No(s): 2CCP*P21A
2CCP*P21B
2CCP*P21C

Code Class: 3

System: 15 - Primary Component Cooling Water

Function: To circulate cooling water through various reactor plant components during normal operation, and through the Residual Heat Removal Heat Exchangers following an accident in order to achieve and maintain the plant in a cold shutdown condition.

Test Requirement: Per OM-6, Paragraph 5.2, "Test Procedure", an inservice test shall be conducted with the pump operating at specified test reference conditions. Per Sub-Paragraph 5.2(b), the resistance of the system shall be varied until the flow rate equals the reference value. The pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the pressure equals the reference value and the flow rate shall be determined and compared to the reference flow rate value.

Basis for Relief: In accordance with 10CFR50.55a(f)(5)(iii), relief is requested on the basis that compliance with the code requirement is impractical at BVPS-2.

The amount of Primary Component Cooling Water (CCP) System flow is dependent on the Service Water System and on seasonal Ohio River water temperatures due to the design of the CCP temperature control system. During Primary Component Cooling Pump testing, additional flow is obtained by placing the Residual Heat Removal (RHR) System Heat Exchangers into service. The overall amount of flow may vary by several hundred gallons per minute between cool winter months and warm summer months.

In order to increase flow to a reference value during cold winter months, the manual valves at the discharge of the RHR Heat Exchangers would require throttling in the open direction. These valves are located in the reactor containment building which is maintained subatmospheric as required by technical specifications. The subatmospheric condition presents a hazardous working environment for station personnel (i.e., requires self-contained breathing apparatus and entry via an airlock into an atmosphere of approximately 9 psia) and is considered inaccessible for surveillance testing. Surveillance testing that requires reactor containment entry is performed at cold shutdown and refueling.

PUMP RELIEF REQUEST 3

Basis for Relief:

In order to throttle flow to a reference value during warm summer months, a manual valve at the discharge of the pumps needs to be used since the RHR Heat Exchanger throttle valves are located inside containment. Operating experience has shown that any throttling of the pump discharge valves results in a large reduction in cooling water flow to the Reactor Coolant Pump thermal barrier heat exchangers, bearing lube oil coolers and motor stator air coolers resulting in low flow alarms. This could result in heatup of the Reactor Coolant Pumps to near required manual pump trip setpoints which could ultimately result in a plant trip. In addition, the added thermal cycling of these coolers for pump testing could prematurely degrade these heat exchangers.

OM-6, Paragraph 4.5, "To Establish an Additional Set of Reference Values", provides for multiple sets of reference values. A pump curve is merely a graphical representation of the fixed response of the pump to an infinite number of flow conditions which are based on some finite number of reference values verified by measurement. Relief is, therefore, requested to use a pump curve, which should provide an equivalent level of quality and safety in trending pump performance and degradation. Flow will be permitted to vary as system conditions require. Delta-P will be calculated and converted to a developed head for which OM-6 ranges will be applied.

Alternate Test:

A pump curve (developed per the guidelines in NUREG-1482, Section 5.2, "Use of Variable Reference Values for Flow Rate and Differential Pressure During Pump Testing") will be used to compare flowrate with developed pump head at the flow conditions dictated by seasonal temperatures each quarter per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (Component Cooling Water Pump Tests). Since normal flow varies based on Component Cooling Water System requirements due to Service Water System and seasonal Ohio River water temperatures, the most limiting vibration acceptance criteria will be used over this range of flows based on baseline vibration data obtained at various flow points on the pump curve.

References:

OM-6, Paragraphs 4.5 and 5.2 (including 5.2(b)).
NUREG-1482, Section 5.2.

PUMP RELIEF REQUEST 4

Pump Mark No(s): 2SWS*P21A
2SWS*P21B
2SWS*P21C

Code Class: 3

System: 30 - Service Water

Function: To provide cooling water to various reactor plant components under normal and emergency conditions, and through the Recirculation Spray Heat Exchangers following a DBA.

Test Requirement: Per OM-6, Paragraph 5.2, "Test Procedure", an inservice test shall be conducted with the pump operating at specified test reference conditions. Per Sub-Paragraph 5.2(b), the resistance of the system shall be varied until the flow rate equals the reference value. The pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the pressure equals the reference value and the flow rate shall be determined and compared to the reference flow rate value.

Basis for Relief: In accordance with 10CFR50.55a(f)(5)(iii), relief is requested on the basis that the proposed alternatives would provide an acceptable level of quality and safety.

Operating experience has shown that plant conditions due to heat loads requiring cooling by the Service Water System may preclude returning the Service Water Pumps to the exact flowrate or differential pressure during pump surveillance testing. The Service Water System is dependent on seasonal Ohio River water temperatures and flow may vary from approximately 6,000 gpm in the cool winter months to approximately 14,000 gpm in the warm summer months.

In order to increase flow to a reference value during cold winter months, idle heat exchangers would need to be placed into service or additional flow would be needed through heat exchangers already in service. Increased cooling flow through primary and secondary component cooling and chiller unit heat exchangers already in service could result in a thermal transient and a potential plant trip. Clean heat exchangers may require placement into service prematurely if additional flow is required to return to a reference value. Idle heat exchangers are normally held in reserve following cleaning to improve plant reliability and safety until one of the inservice heat exchangers becomes fouled.

PUMP RELIEF REQUEST 4

Basis for Relief:

In order to throttle flow to a reference value during warm summer months, any inservice primary and secondary component cooling and chiller unit heat exchangers would need flow reduced or isolated which could interrupt flow of cooling water to Train A or Train B cooling loads resulting in a thermal transient and potential plant trip. In addition, the added thermal cycling due to placement and/or removal of heat exchangers from service for pump testing could prematurely degrade the heat exchangers.

The thermal transients created by increasing or throttling Service Water System flow to the turbine plant cooling loads raises operational concerns of stability problems. Changes in oil temperature from the turbine generator lube oil system create vibration problems. Changes in the Hydrogen gas cooler temperatures could imply problems or mask real problems with the generator. Chiller unit heat exchanger flow disturbances often result in a trip of the chiller unit causing reactor containment temperature risks of exceeding the technical specification limit.

OM-6, Paragraph 4.5, "To Establish an Additional Set of Reference Values", provides for multiple sets of reference values. A pump curve is merely a graphical representation of the fixed response of the pump to an infinite number of flow conditions which are based on some finite number of reference values verified by measurement. Relief is, therefore, requested to use a pump curve, which should provide an equivalent level of quality and safety in trending pump performance and degradation. Flow will be permitted to vary as system conditions require. Delta-P will be calculated and converted to a developed head for which OM-6 ranges will be applied.

Alternate Test:

A pump curve (developed per the guidelines in NUREG-1482, Section 5.2, "Use of Variable Reference Values for Flow Rate and Differential Pressure During Pump Testing") will be used to compare flowrate with developed pump head at the flow conditions dictated by Service Water System loads each quarter per 2OST-30.2, 2OST-30.3, and 2OST-30.6 (Service Water Pump Tests). Since normal flow varies based on Service Water System requirements due to seasonal Ohio River water temperatures, the most limiting vibration acceptance criteria will be used over this range of flows based on baseline vibration data obtained at various flow points on the pump curve.

References:

OM-6, Paragraphs 4.5 and 5.2 (including 5.2(b)).
NUREG-1482, Section 5.2.

PUMP RELIEF REQUEST 5

Pump Mark No(s): 2SWS*P21A
2SWS*P21B
2SWS*P21C

Code Class: 3

System: 30 - Service Water

Function: To provide cooling water to various reactor plant components under normal and emergency conditions, and through the Recirculation Spray Heat Exchangers following a DBA.

Test Requirement: Per OM-6, Paragraph 4.6.4(b), "Vibration Measurements", on vertical line shaft pumps, measurements shall be taken on the upper motor bearing housing in three orthogonal directions, one of which is the axial direction.

Basis for Relief: In accordance with 10CFR50.55a(f)(5)(iii), relief is requested on the basis that compliance with the code requirement is impractical at BVPS-2.

Access to the upper motor bearing housing on the vertical line shaft Service Water Pumps for the purpose of measuring vibrations in the axial direction, cannot be obtained due to the presence of a permanently installed non-rigid metal top hat covering the entire top of the motor housing. However, vibration measurements in the axial direction are accessible at the lower motor bearing housing of each pump which will provide additional information for trending of pump/motor performance. In addition, the vibration measurements in the orthogonal directions typically provide a better predictor of vibration problems for vertical line shaft pumps.

Alternate Test: Measure vibrations on the upper motor bearing housing in two orthogonal directions (excluding the axial direction), and measure vibrations on the lower motor bearing housing in three orthogonal directions (including the axial direction) each quarter per 2OST-30.2, 2OST-30.3 and 2OST-30.6 (Service Water Pump Tests).

References: OM-6, Paragraphs 4.6.4(b).

PUMP RELIEF REQUEST 6

Pump Mark No(s): 2EGF*P21A
2EGF*P21B
2EGF*P21C
2EGF*P21D

Code Class: 3

System: 36 - Diesel Fuel Oil

Function: To transfer fuel oil from the underground Emergency Diesel Generator Fuel Oil Storage Tank to the Day Tank in order to provide continuous operation of the Diesel at rated load for up to 7 days during an emergency.

Test Requirement: Per OM-6, Paragraph 4.6.5, "Flow Rate Measurement", and Table 2, "Inservice Test Parameters", flow rate shall be measured for all pumps. When measuring flow rate, use a rate or quantity meter installed in the pump test circuit. If a meter does not indicate the flow rate directly, the record shall include the method used to reduce the data.

Basis for Relief: In accordance with 10CFR50.55a(f)(5)(iii), relief is requested on the basis that compliance with the code requirement is impractical at BVPS-2.

There is no installed instrumentation provided to measure flow rate for these Emergency Diesel Generator Fuel Oil Transfer Pumps. However, a level sight glass does exist on the side of the Diesel Generator Fuel Oil Day Tank which can be used to measure a change in level over time as the pumps transfer fuel oil from the underground Storage Tank to the Day Tank. The reading scale for measuring the level change over time, and the calculational method yield an accuracy within ± 2% as required by OM-6, Paragraph 4.6.1.1, "Quality", and Table 1, "Acceptable Instrument Accuracy".

Alternate Test: Flow rate will be calculated by measuring the level change over time in the Diesel Generator Fuel Oil Day Tank, and converting this data into Fuel Oil Transfer Pump flow rate at least quarterly per 2OST-36.1 and 2OST-36.2 (Emergency Diesel Generator and Fuel Oil Transfer Pump Tests).

References: OM-6, Paragraphs 4.6.1.1, 4.6.5 and 5.2, and Tables 1 and 2.

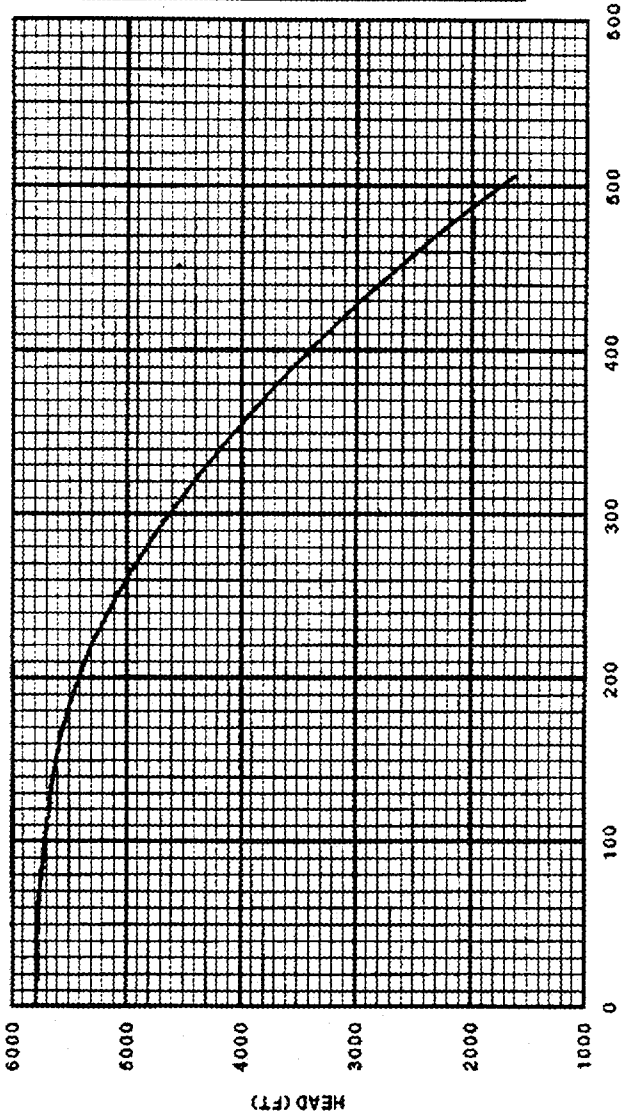
SECTION VI: PUMP MINIMUM OPERATING POINT (MOP) CURVES

Pump Name: 21A Charging Pump **Pump Number:** 2CHS*P21A

[2CHS*P21A]
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	5794
60	5778
125	5675
215	5331
263	4983
299	4632
331	4284
360	3939
386	3599
410	3258
433	2922
454	2586
473	2251
491	1917
506	1630



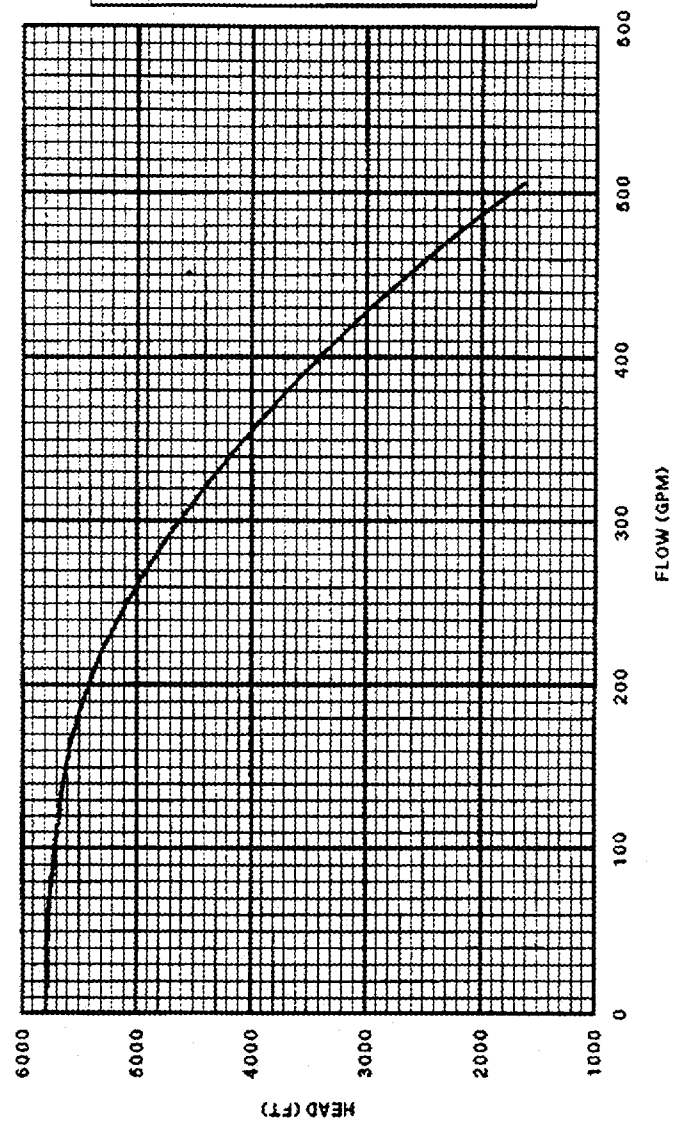
SUPPLIED BY NED PER EM 115707 (REFERENCE CALC. 10080-N-747-0, A.2) DATED 1/2/98.

Pump Name: 21A Charging Pump **Pump Number:** 2CHS*P21A

[2CHS*P21A]
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	5794
60	5778
125	5675
215	5331
263	4983
299	4632
331	4284
360	3939
386	3599
410	3258
433	2922
454	2586
473	2251
491	1917
506	1630



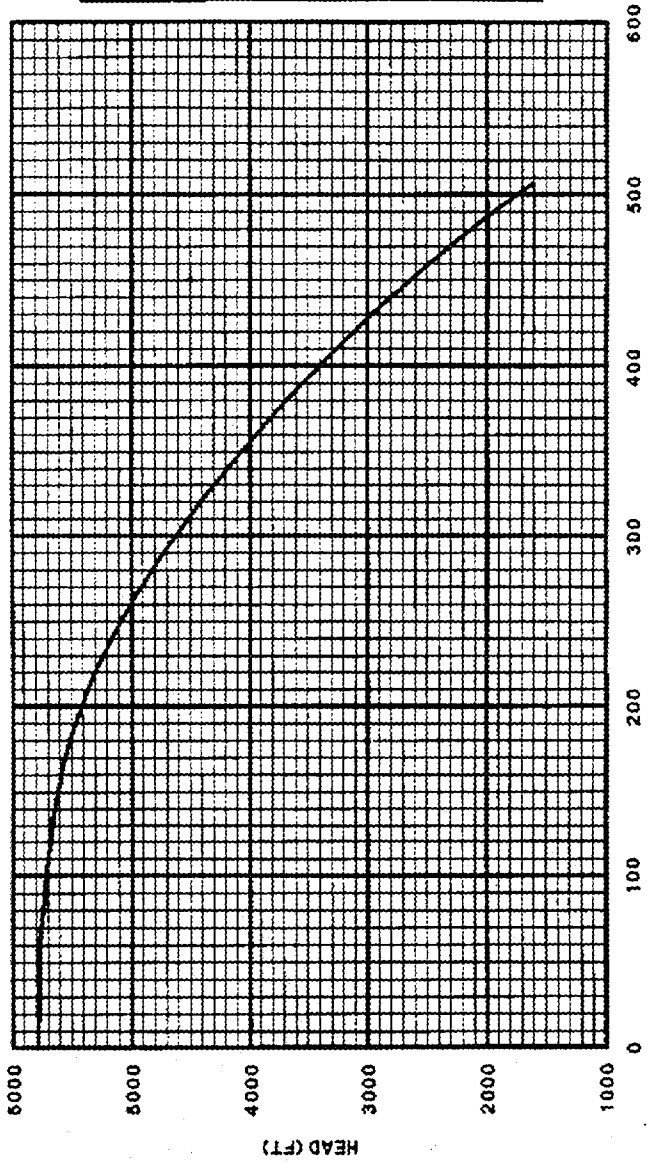
SUPPLIED BY NED PER EM 115707 (REFERENCE CALC. 10080-N-747-0, A.2) DATED 1/2/98.

Pump Name: 21B Charging Pump **Pump Number:** 2CHS*P21B

[2CHS*P21B]
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	5794
60	5778
125	5675
215	5331
263	4983
299	4632
331	4284
360	3939
386	3599
410	3258
433	2922
454	2586
473	2251
491	1917
506	1630



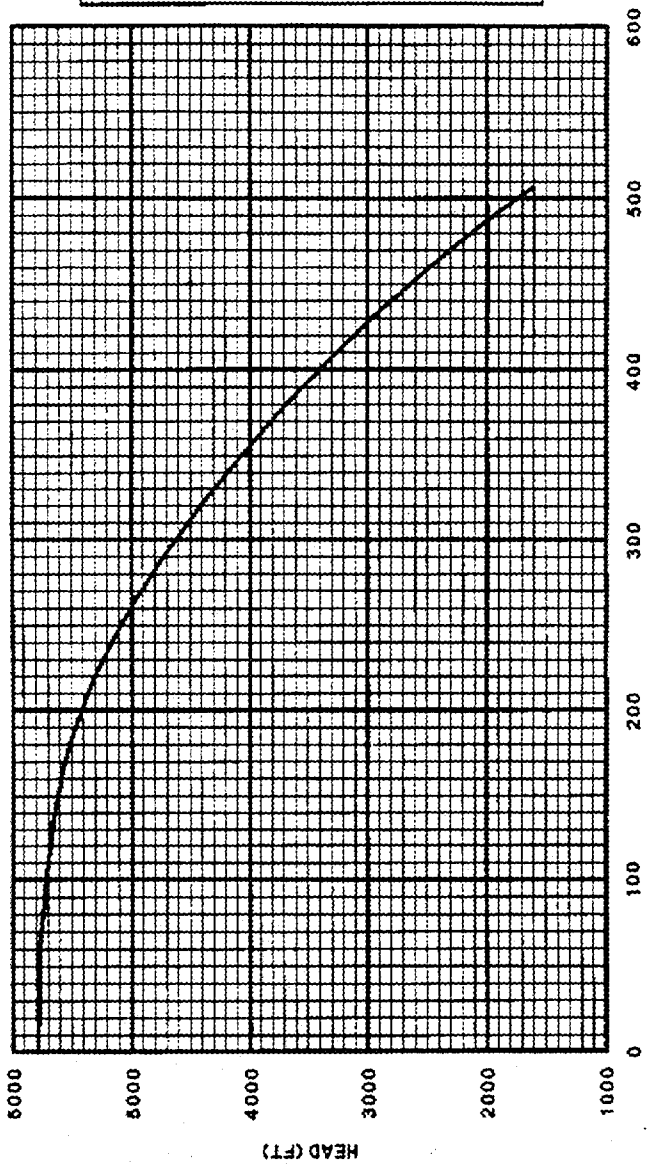
SUPPLIED BY NED PER EM 116707 (REFERENCE CALC. 10080-N-747-0, A.2) DATED 1/2/98.

Pump Name: 21B Charging Pump **Pump Number:** 2CHS*P21B

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	5794
60	5778
125	5675
215	5331
263	4983
299	4632
331	4284
360	3939
386	3599
410	3258
433	2922
454	2586
473	2251
491	1917
506	1630

[2CHS*P21B]
MOP CURVE



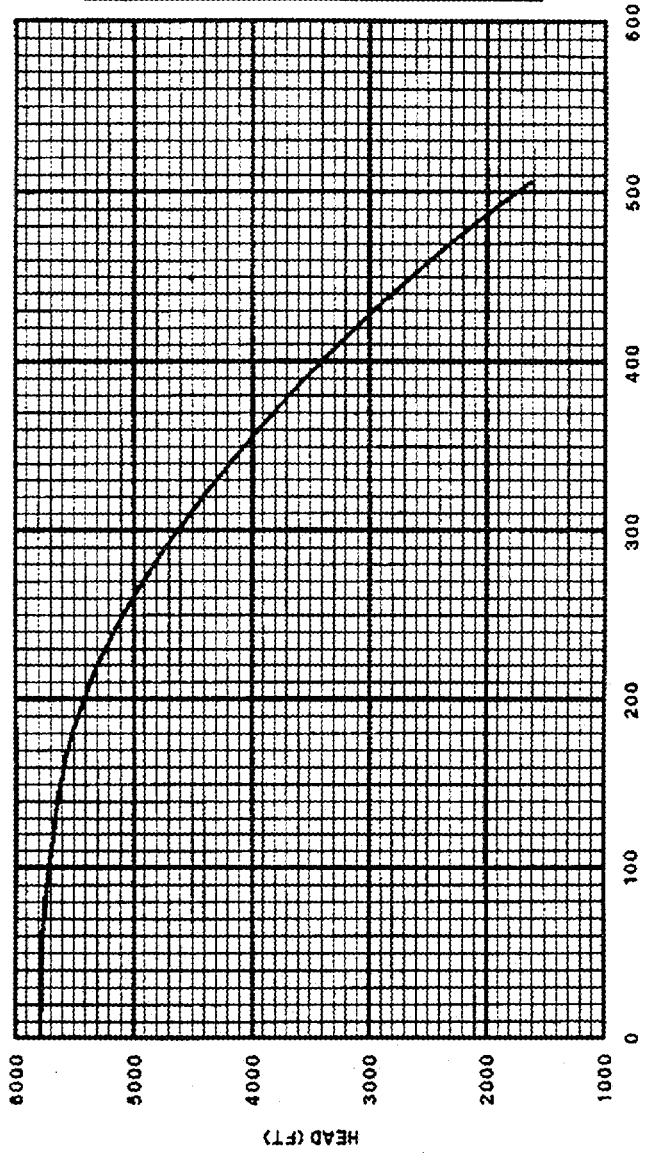
SUPPLIED BY NED PER EM 116707 (REFERENCE CALC. 10080-N-747-0, A.2) DATED 1/2/98.

Pump Name: 21C Charging Pump **Pump Number:** 2CHS*P21C

[2CHS*P21C]
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	5794
60	5778
125	5675
215	5331
263	4983
299	4632
331	4284
360	3939
386	3599
410	3258
433	2922
454	2586
473	2251
491	1917
506	1630



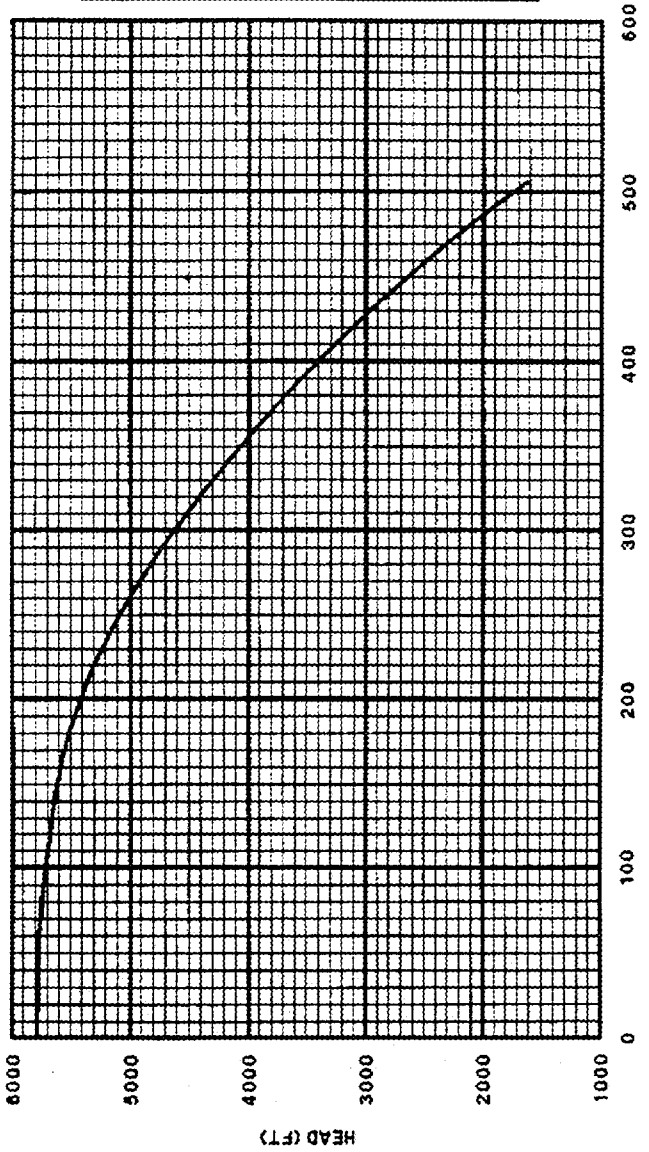
SUPPLIED BY NED PER EM 115707 (REFERENCE CALC. 10080-N-747-0, A.2) DATED 1/2/98.

Pump Name: 21C Charging Pump **Pump Number:** 2CHS*P21C

[2CHS*P21C]
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	5794
60	5778
125	5675
215	5331
263	4983
299	4632
331	4284
360	3939
386	3599
410	3258
433	2922
454	2586
473	2251
491	1917
506	1630



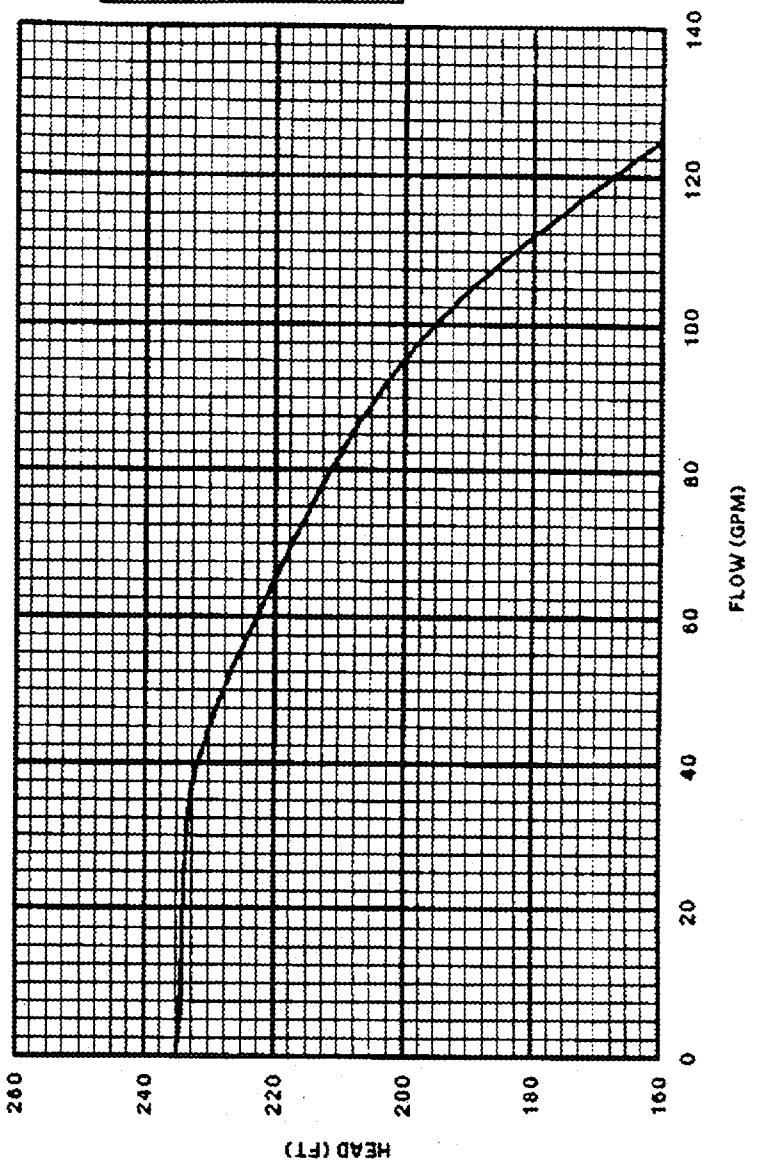
SUPPLIED BY NED PER EM 115707 (REFERENCE CALC. 10080-N-747-0, A.2) DATED 1/2/98.

Pump Name: 22A Boric Aicd Transfer Pump **Pump Number:** 2CHS*P22A

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	235
20	234
40	232
60	223
80	212
100	195
120	168
125	160

2CHS*P22A
MOP CURVE



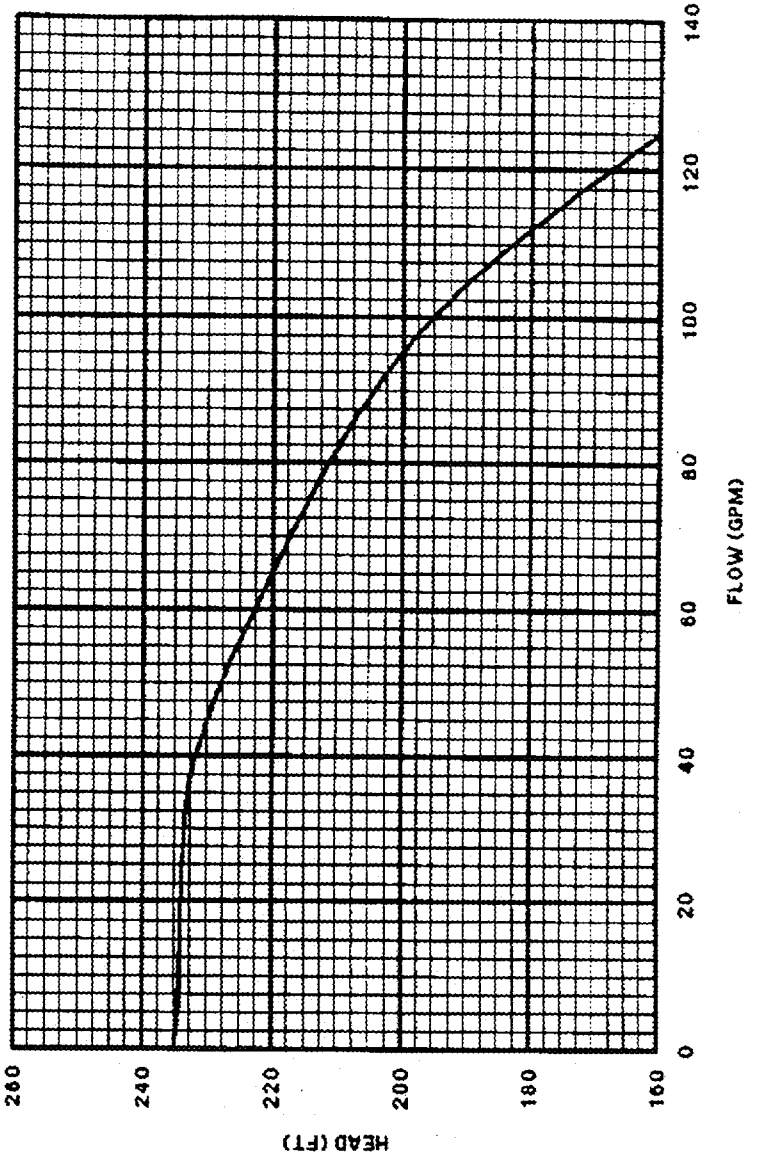
SUPPLIED BY WESTINGHOUSE PER
LETTER NO. BV2-SET-024 (2/3/87).

Pump Name: 22A Boric Aicd Transfer Pump **Pump Number:** 2CHS*P22A

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	235
20	234
40	232
60	223
80	212
100	195
120	168
125	160

2CHS*P22A
MOP CURVE



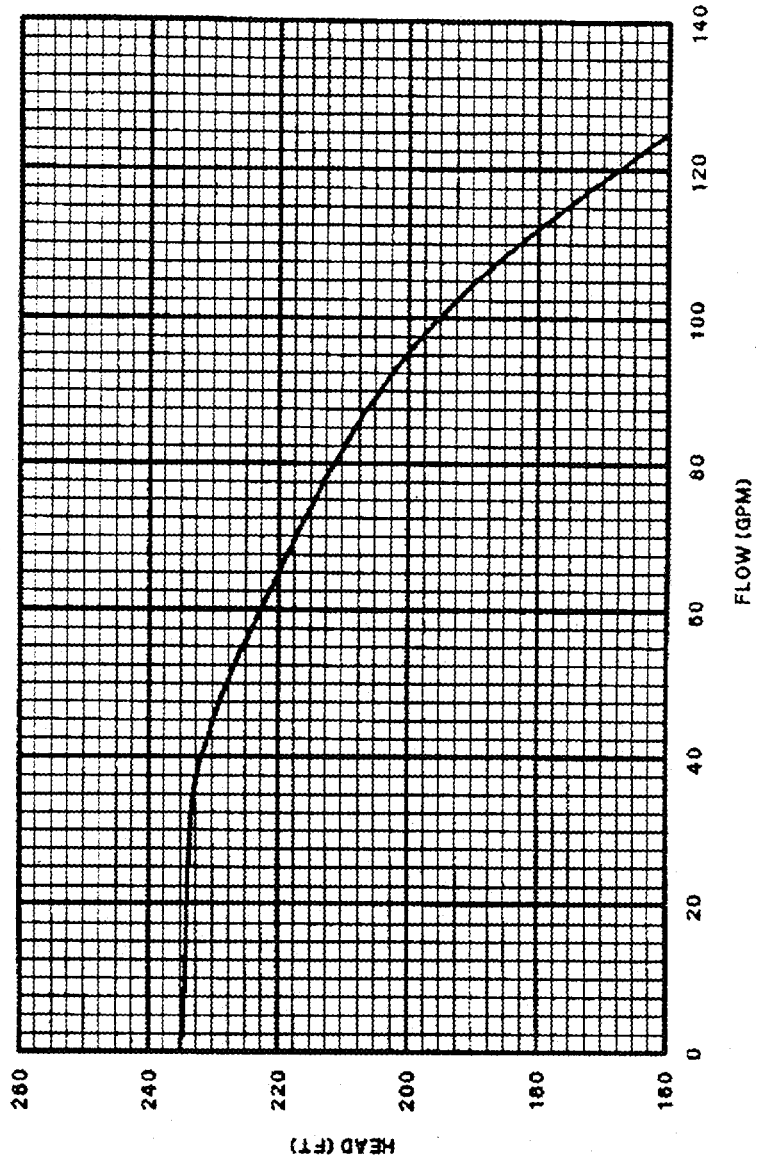
SUPPLIED BY WESTINGHOUSE PER
LETTER NO. BV2-SET-024 (2/3/87).

Pump Name: 22B Boric Aicd Transfer Pump **Pump Number:** 2CHS*P22B

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	235
20	234
40	232
60	223
80	212
100	195
120	168
125	160

2CHS*P22B
MOP CURVE

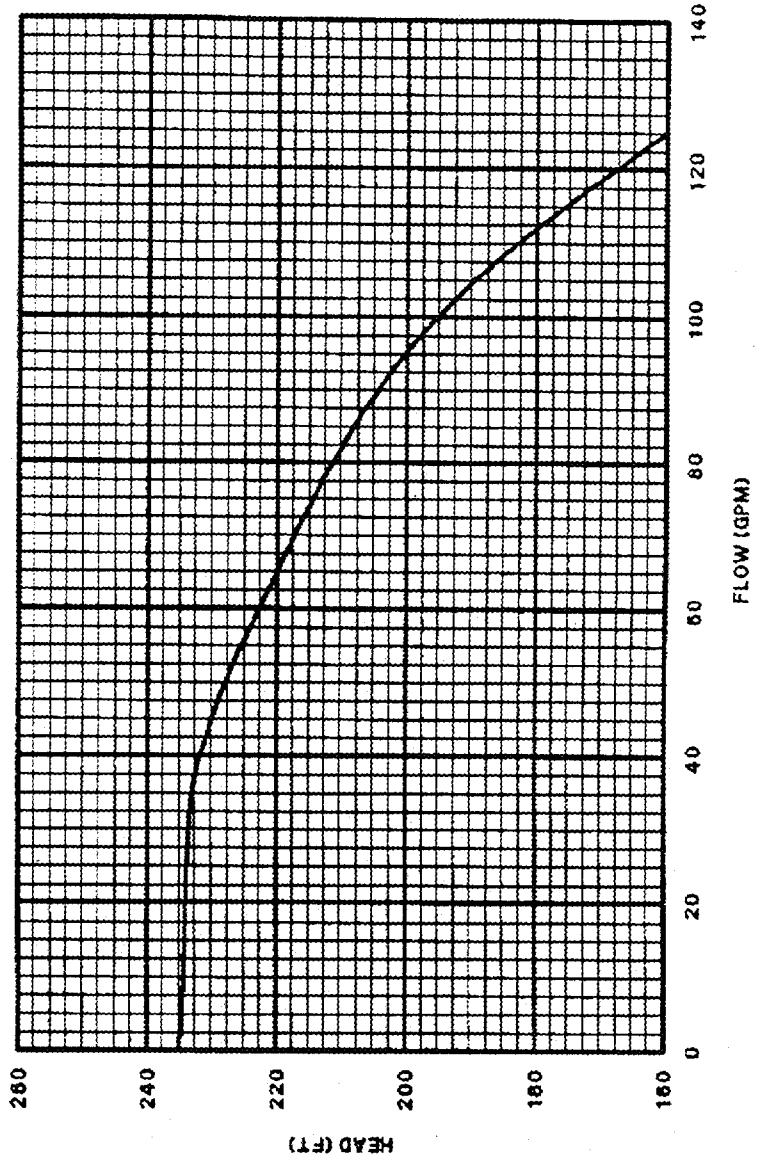


SUPPLIED BY WESTINGHOUSE PER
LETTER NO. BV2-SET-024 (2/3/87)

Pump Name: 22B Boric Aicd Transfer Pump **Pump Number:** 2CHS*P22B

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	235
20	234
40	232
60	223
80	212
100	195
120	168
125	160



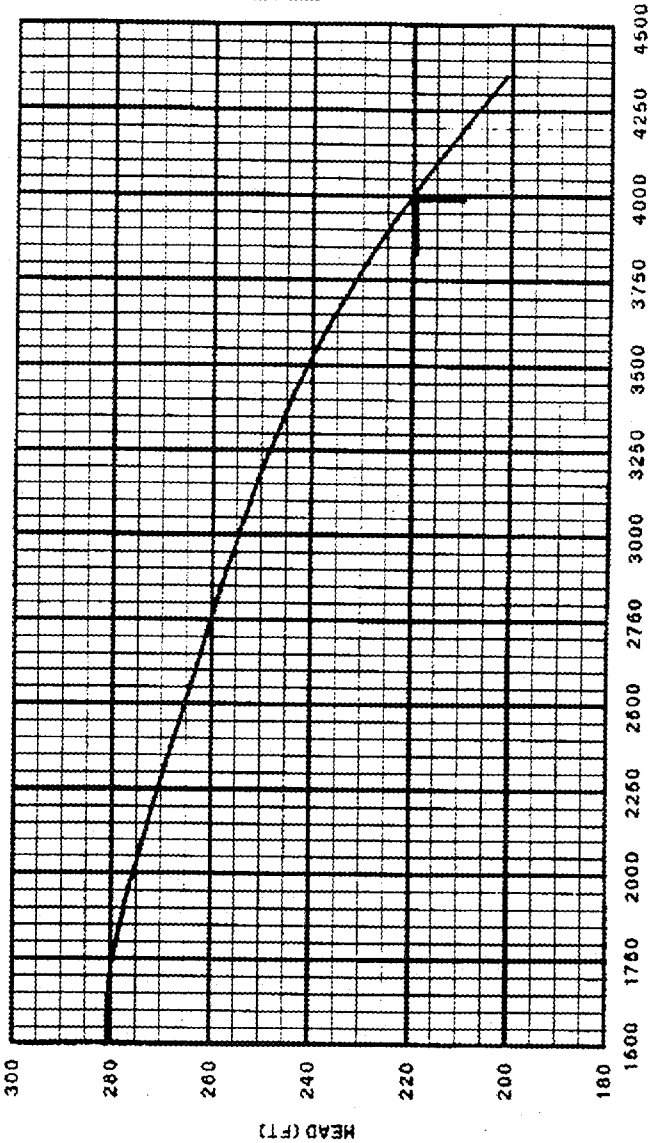
SUPPLIED BY WESTINGHOUSE PER
LETTER NO. BV2-SET-024 (2/3/87)

Pump Name: 21A Residual Heat Removal Pump **Pump Number:** 2RHS*P21A

2RHS*P21A
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
1500	280.8
2020	275.3
2830	258.4
3550	239.2
4000	220.0
4350	201.2



MOP POINT IS AT 220 FT AT 4000 GPM PER CALC. NO. BV2-SET-024 AND EM 113379 (11/15/96).

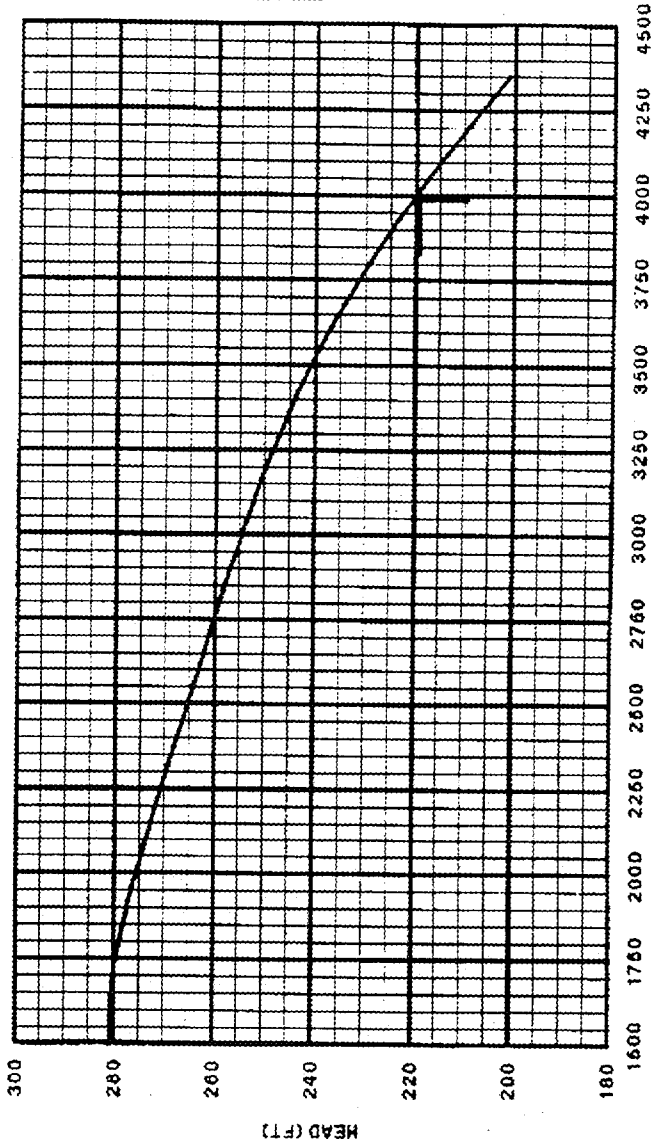
MOP CURVE IS DERIVED AS 95.72% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 11/15/96.

Pump Name: 21A Residual Heat Removal Pump **Pump Number:** 2RHS*P21A

2RHS*P21A
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
1500	280.8
2020	275.3
2830	258.4
3550	239.2
4000	220.0
4350	201.2

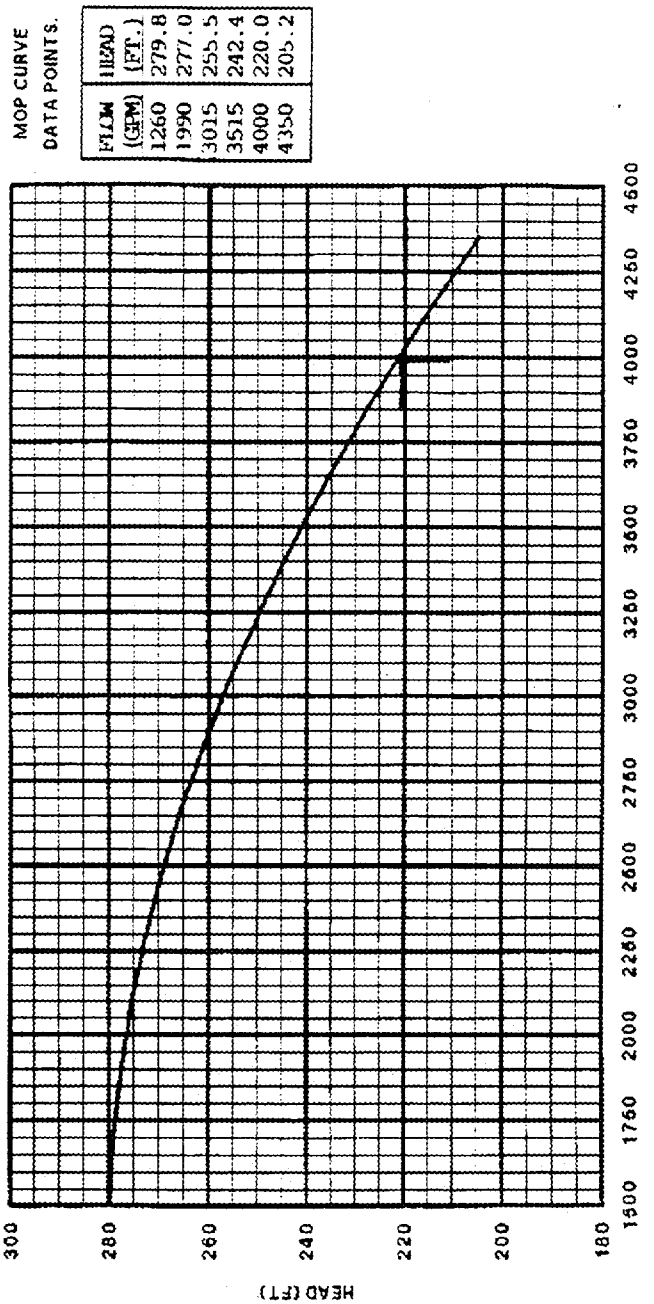


MOP POINT IS AT 220 FT AT 4000 GPM PER CALC. NO. BY2-SET-024 AND EM 113379 (11/15/96).

MOP CURVE IS DERIVED AS 95.72% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 11/15/96.

Pump Name: 21B Residual Heat Removal Pump **Pump Number:** 2RHS*P21B

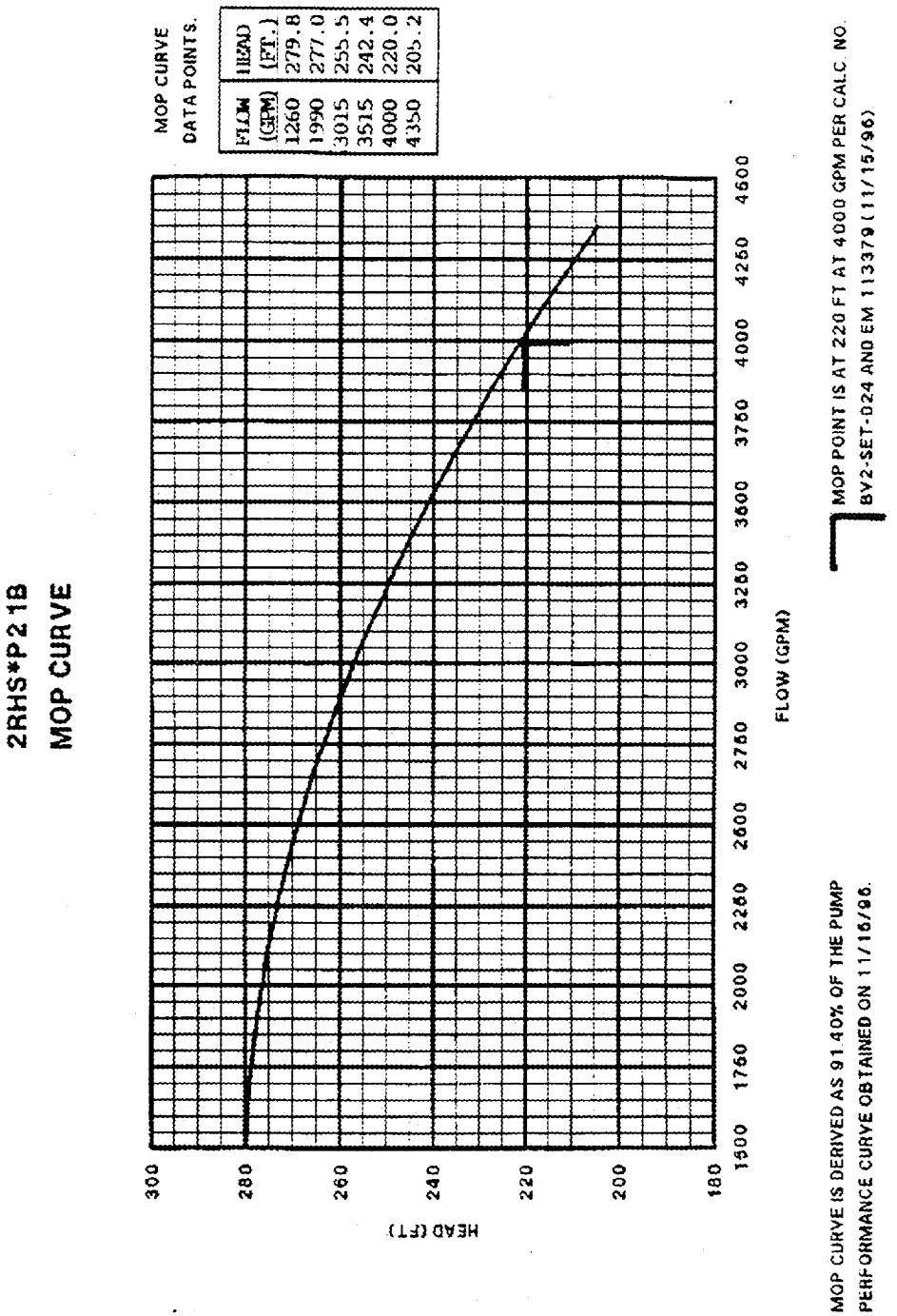
2RHS*P21B
MOP CURVE



MOP POINT IS AT 220 FT AT 4000 GPM PER CALC NO. BV2-SET-024 AND EM 113379 (11/15/96)

MOP CURVE IS DERIVED AS 91.40% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 11/16/96.

Pump Name: 21B Residual Heat Removal Pump **Pump Number:** 2RHS*P21B

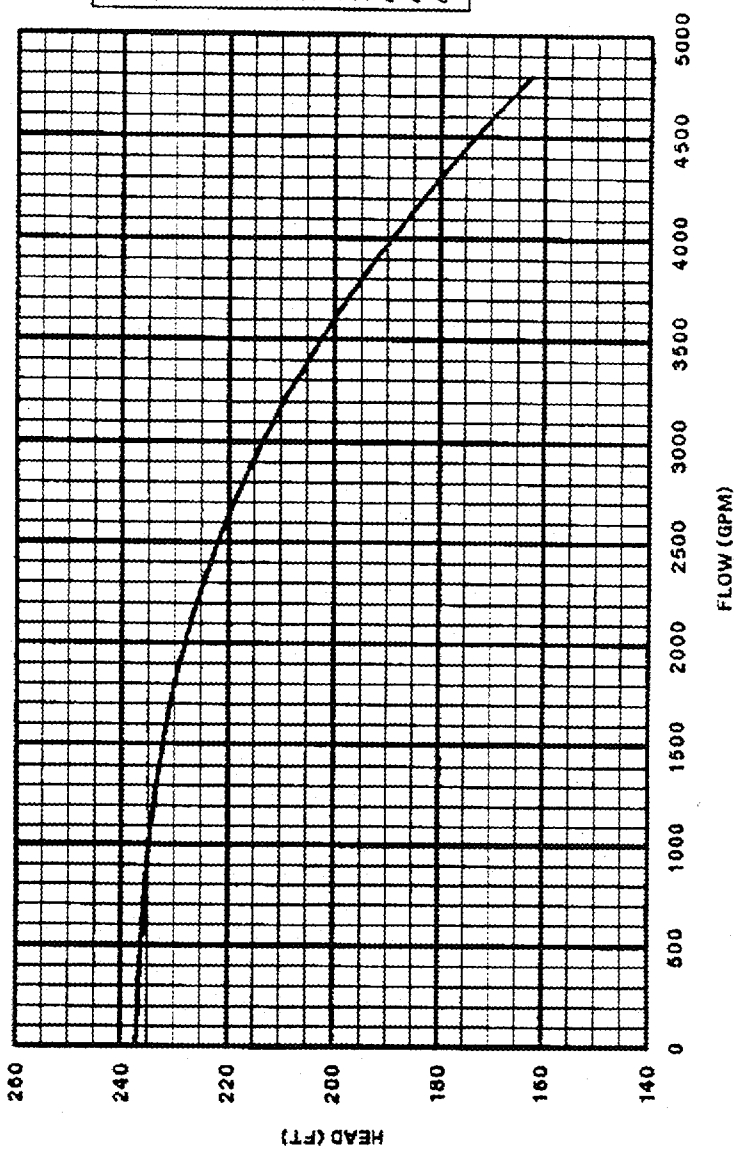


Pump Name: 21A Low Head Safety Injection Pump **Pump Number:** 2SIS*P21A

2SIS*P21A
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	237.1
800	235.6
1600	231.6
2000	228.1
2400	223.3
2800	217.2
3200	209.4
3600	200.1
4000	189.2
4400	176.7
4800	162.6



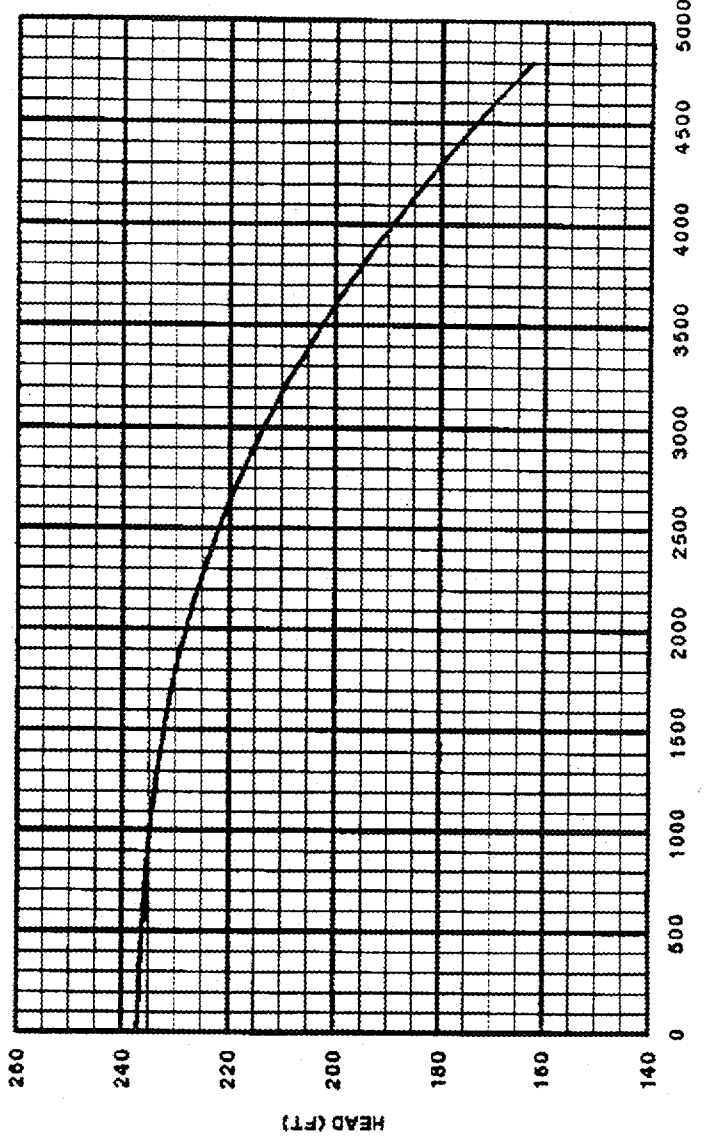
SUPPLIED BY WESTINGHOUSE PER CALCULATION NO. PS-C-104 (5/10/93).

Pump Name: 21A Low Head Safety Injection Pump **Pump Number:** 2SIS*P21A

2SIS*P21A
MOP CURVE

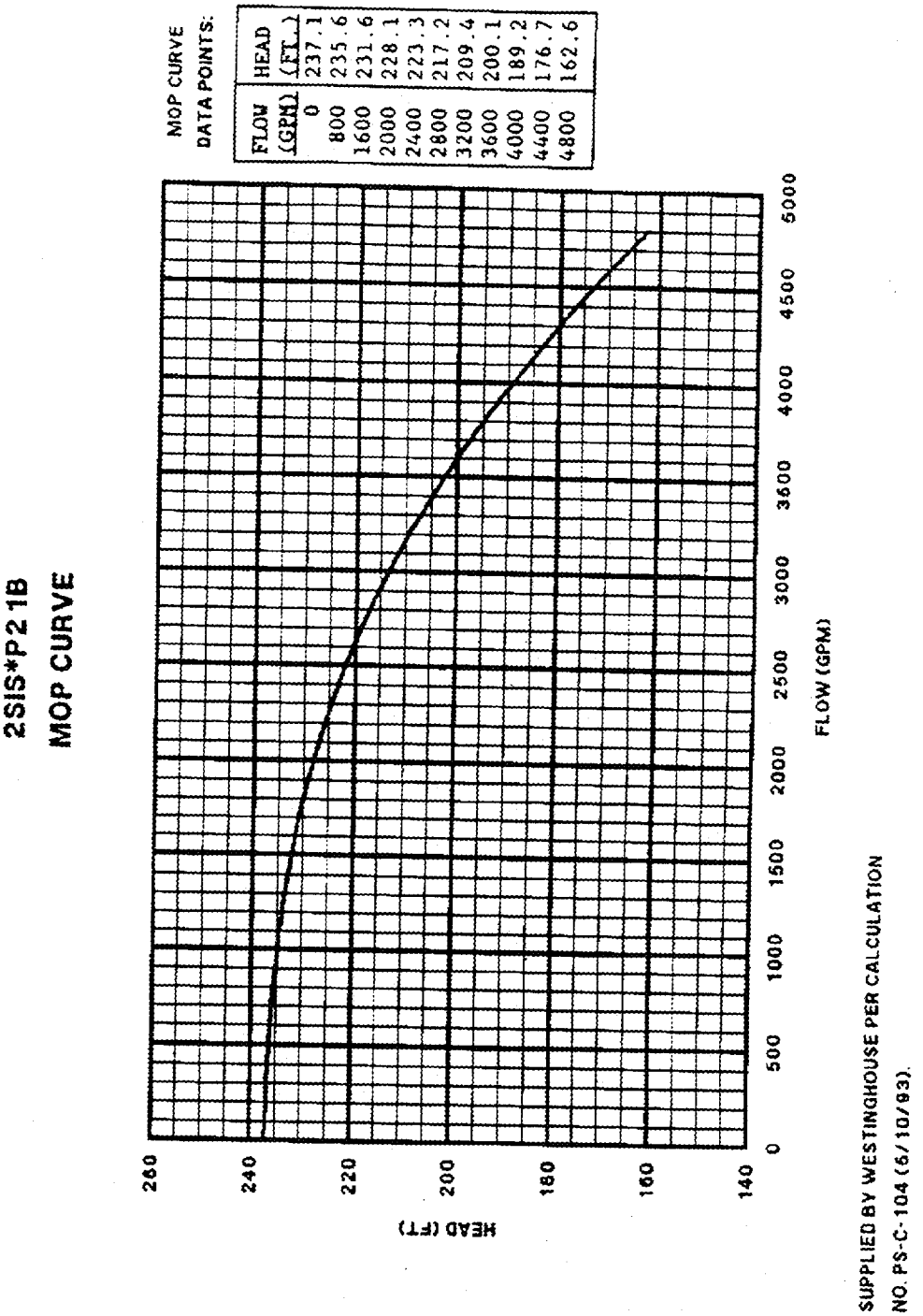
MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	237.1
800	235.6
1600	231.6
2000	228.1
2400	223.3
2800	217.2
3200	209.4
3600	200.1
4000	189.2
4400	176.7
4800	162.6

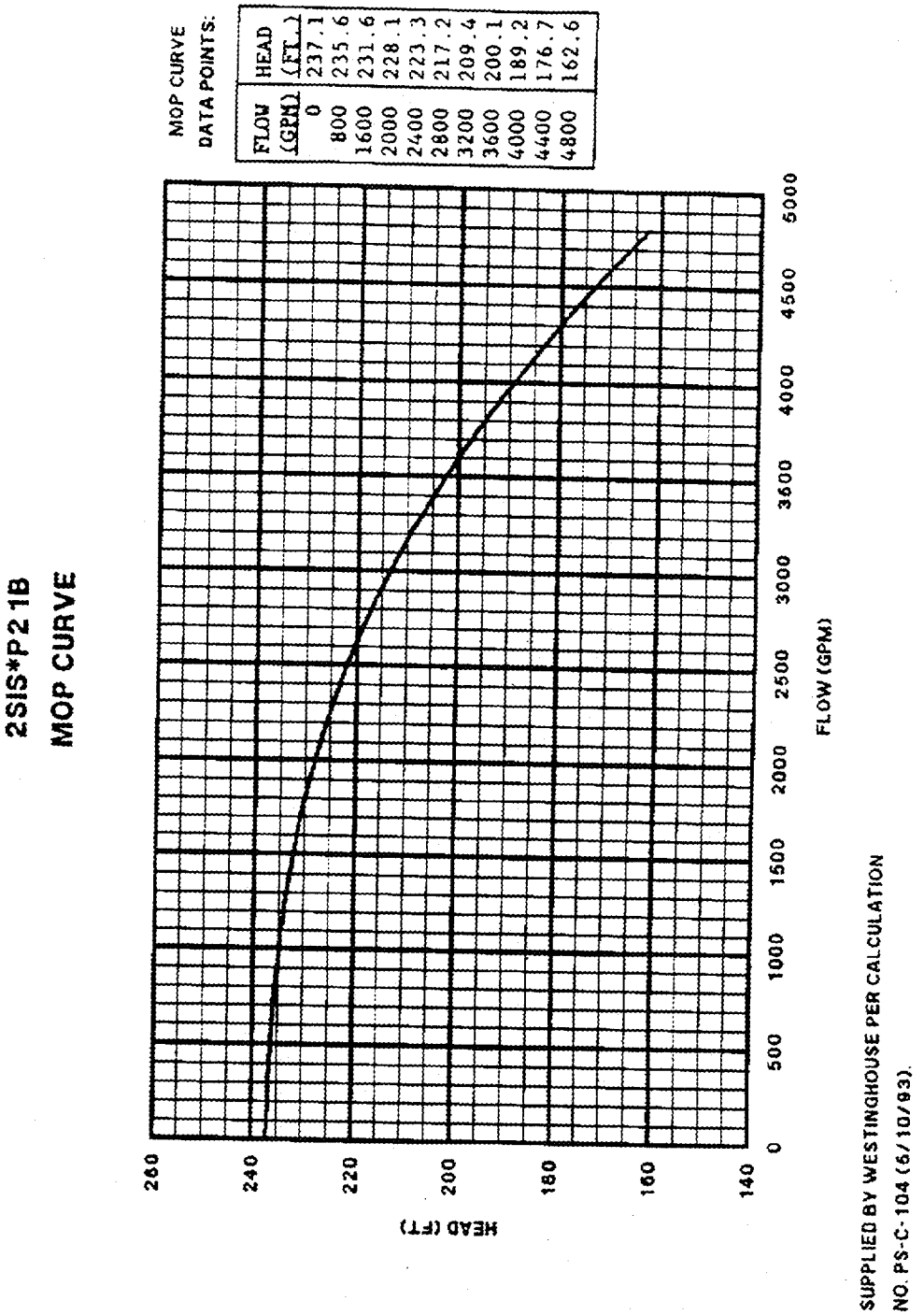


SUPPLIED BY WESTINGHOUSE PER CALCULATION NO. PS-C-104 (5/10/93).

Pump Name: 21B Low Head Safety Injection Pump **Pump Number:** 2SIS*P21B



Pump Name: 21B Low Head Safety Injection Pump **Pump Number:** 2SIS*P21B

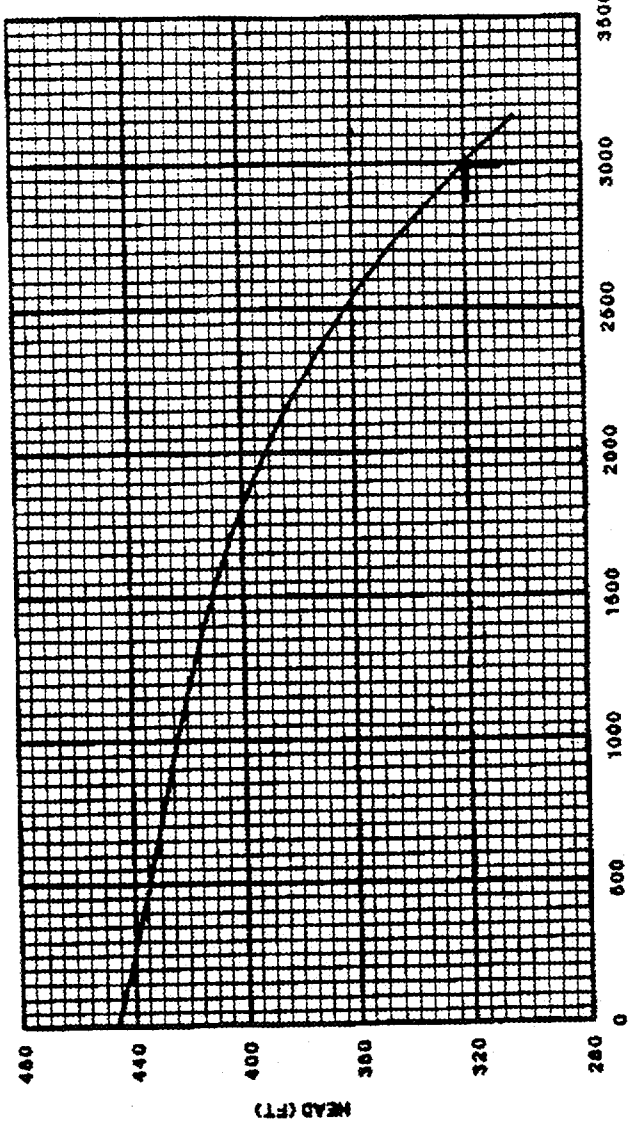


Pump Name: 21A Quench Spray Pump **Pump Number:** 2QSS*P21A

2QSS*P21A
MOP CURVE

MOP CURVE
DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	446.6
430	436.0
860	426.9
1290	416.7
1720	403.3
2150	384.1
2580	356.8
3000	320.0
3160	302.9



MOP POINT IS AT 320 FT AT 3000 GPM PER CALC 12241-US(B)-193-1(6/24/89)

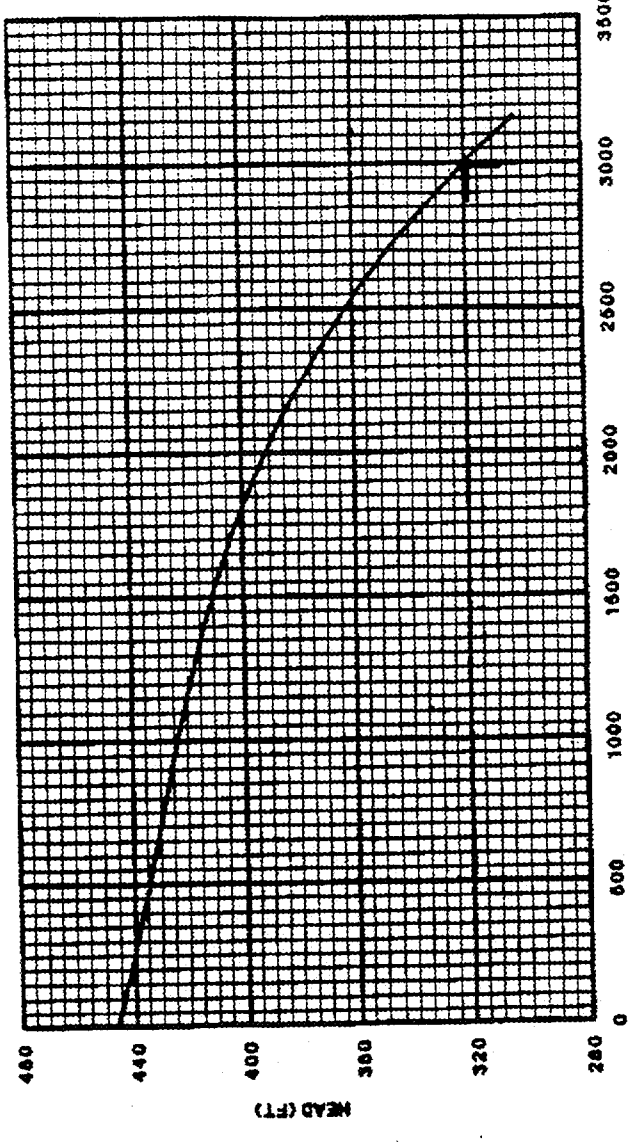
DERIVED AS 98.36% OF PUMP PERFORMANCE CURVE OBTAINED ON 3/12/87.

Pump Name: 21A Quench Spray Pump **Pump Number:** 2QSS*P21A

2QSS*P21A
MOP CURVE

MOP CURVE
DATA POINTS:

FLOW (GPM)	HEAD (FT.)
0	446.6
430	436.0
860	426.9
1290	416.7
1720	403.3
2150	384.1
2580	356.8
3000	320.0
3160	302.9

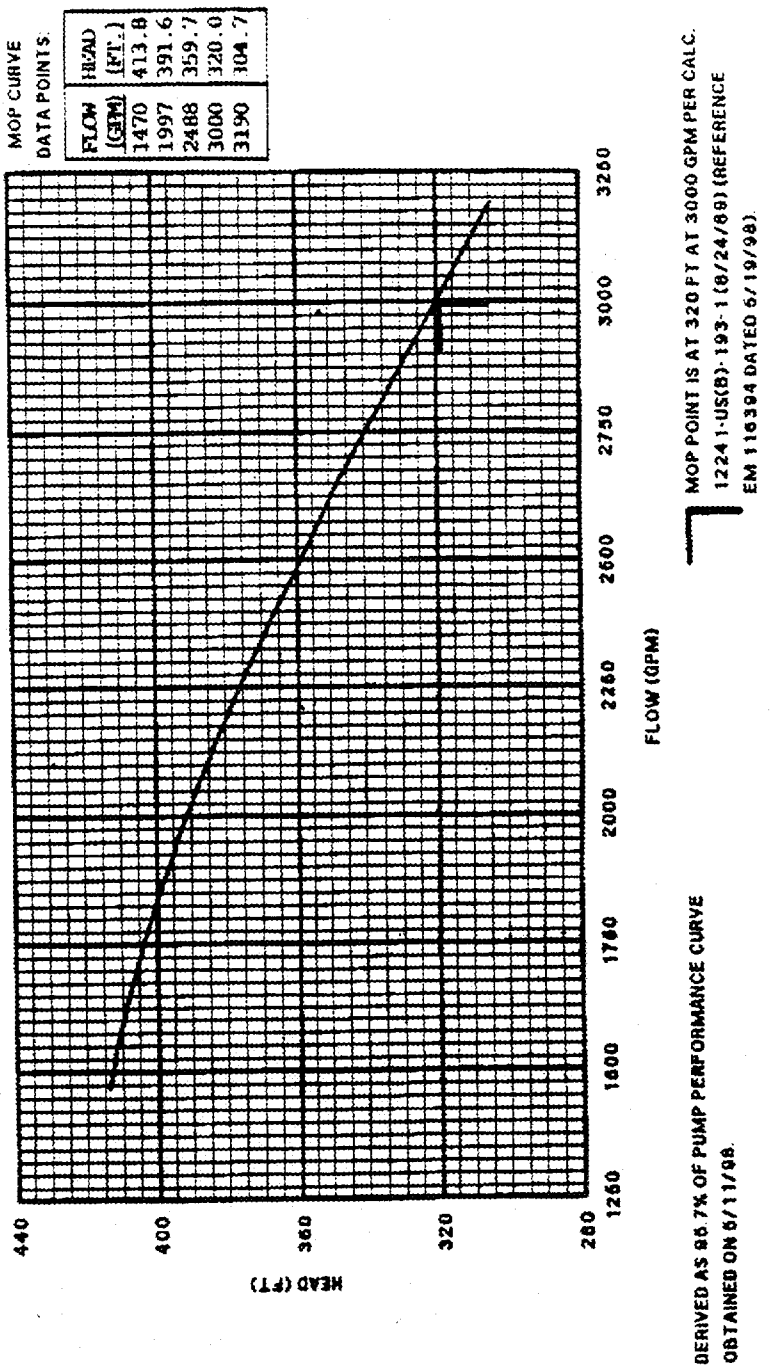


MOP POINT IS AT 320 FT AT 3000 GPM PER CALC
12241-US(B)-193-1(6/24/69)

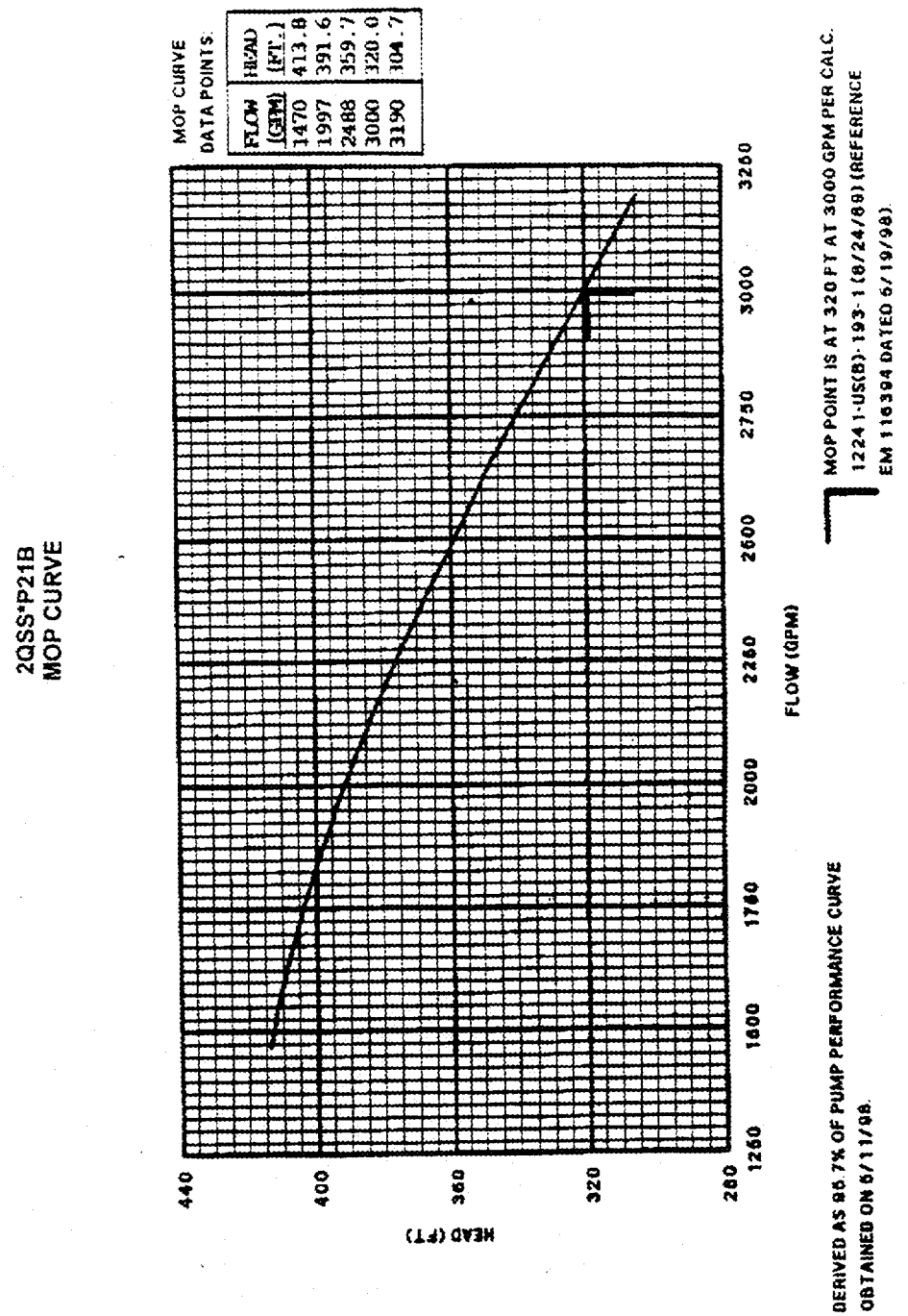
DERIVED AS 96.36% OF PUMP PERFORMANCE CURVE
OBTAINED ON 3/12/87.

Pump Name: 21B Quench Spray Pump **Pump Number:** 2QSS*P21B

2QSS*P21B
MOP CURVE



Pump Name: 21B Quench Spray Pump **Pump Number:** 2QSS*P21B

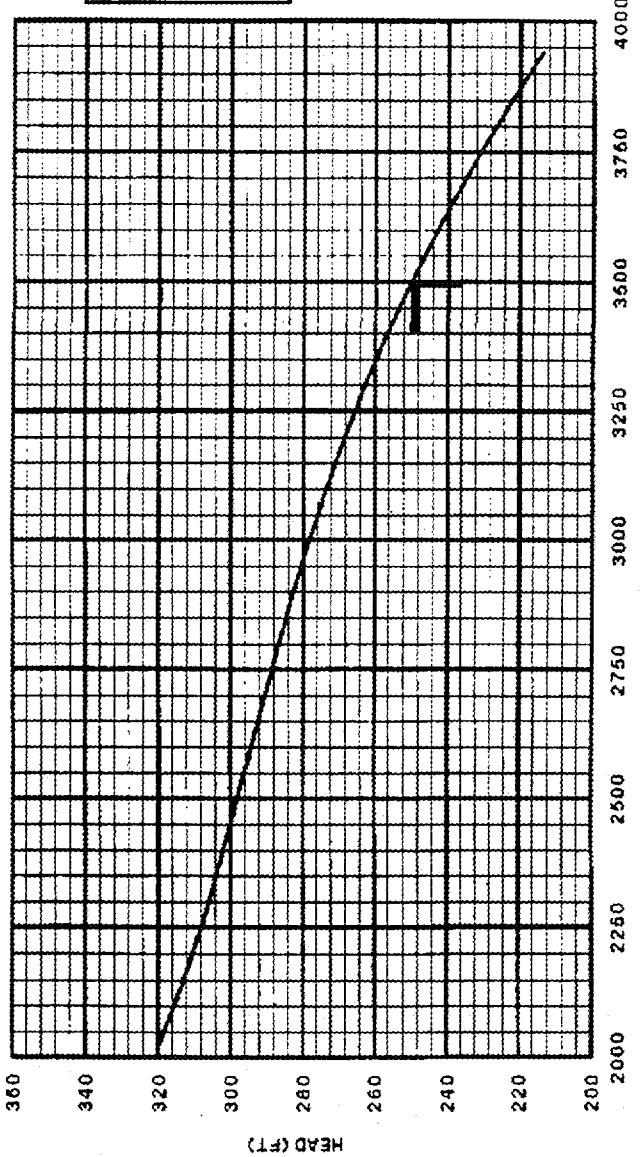


Pump Name: 21A Recirculation Spray Pump **Pump Number:** 2RSS*P21A

2RSS*P21A
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
2025	320
2533	297
3002	278
3500	250
3940	214



MOP POINT IS AT 250 FT AT 3500 GPM, AND IS BASED ON THE NUMBER OF TUBES PLUGGED IN (2RSS*E21A) PER EM 110133 AND CALC.10080-N-724-0 (4/19/95).

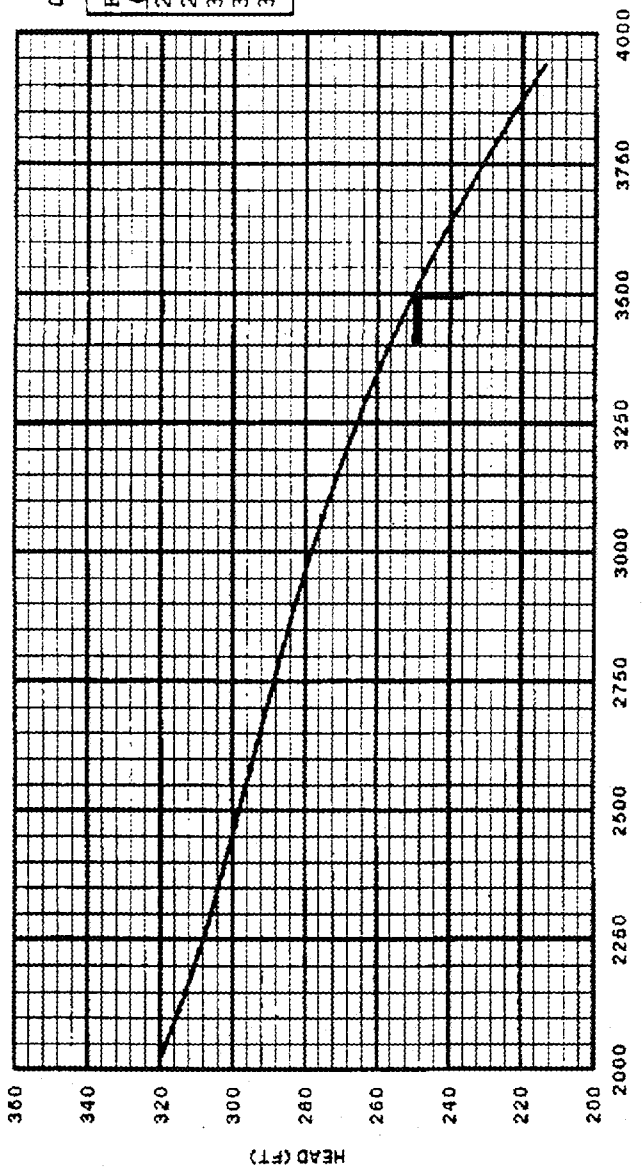
MOP CURVE IS DERIVED AS 97.88% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 4/17/96. (CURRENT # TUBES PLUGGED IN (2RSS*E21A) = 28)

Pump Name: 21A Recirculation Spray Pump **Pump Number:** 2RSS*P21A

2RSS*P21A
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
2025	320
2533	297
3002	278
3500	250
3940	214

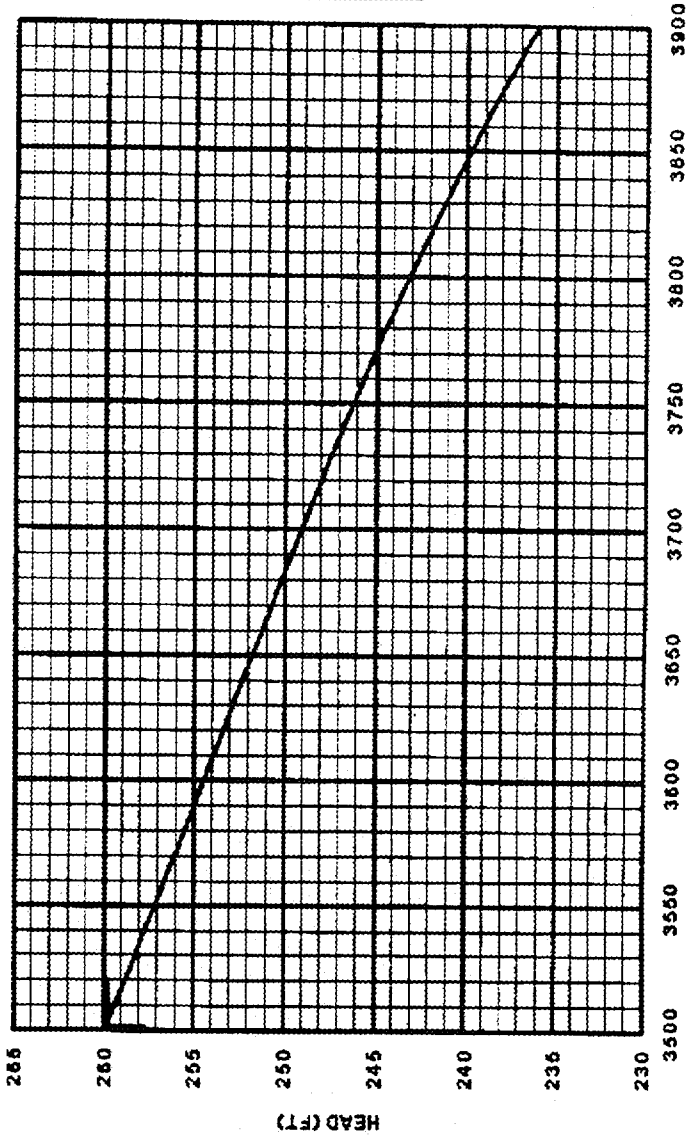


MOP POINT IS AT 250 FT AT 3500 GPM, AND IS BASED ON THE NUMBER OF TUBES PLUGGED IN (2RSS*E21A) PER EM 110133 AND CALC. 10080-N-724-0 (4/19/95).

MOP CURVE IS DERIVED AS 97.88% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 4/17/95. (CURRENT # TUBES PLUGGED IN (2RSS*E21A) = 28)

Pump Name: 21B Recirculation Spray Pump **Pump Number:** 2RSS*P21B

2RSS*P21B
MOP CURVE

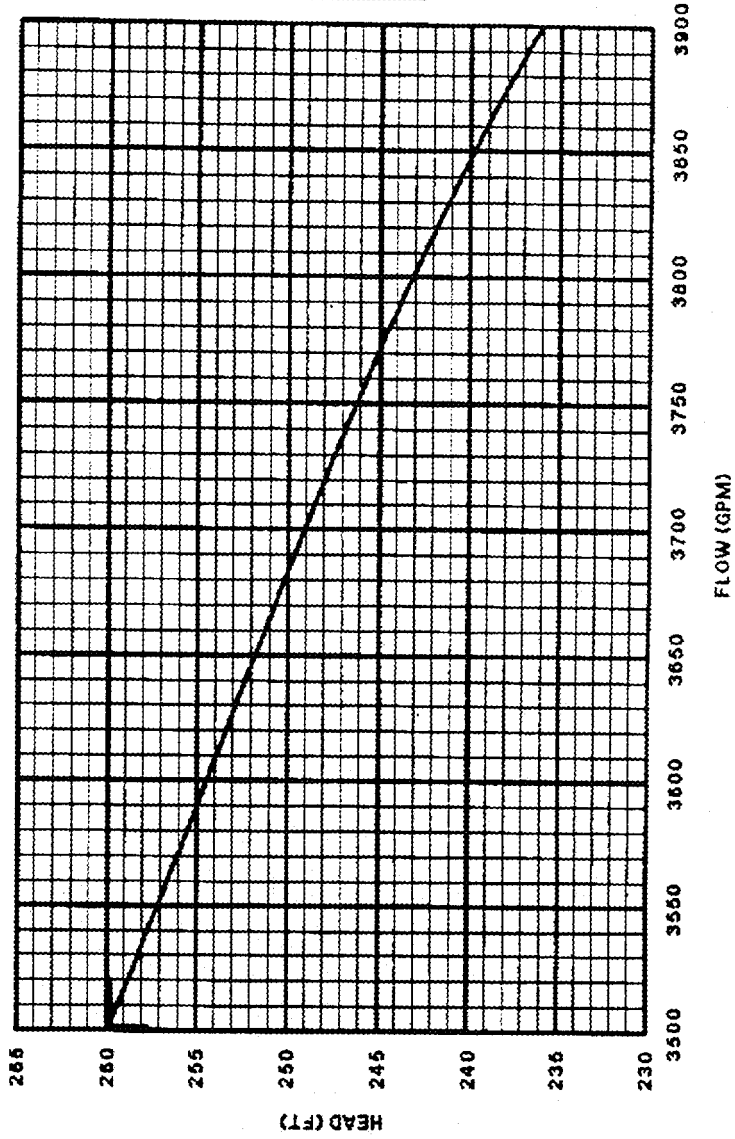


MOP PT. IS AT 260 FT AT 3500 GPM AND IS DERIVED FROM SWEC CALC. 12241-US(B)-193-0 (2/18/93), (REFERENCE LETTER 2DLS-28716, DATED 8/7/86).

MOP CURVE SUPPLIED BY ENGINEERING PER EM 63835 (3/14/89).

Pump Name: 21B Recirculation Spray Pump **Pump Number:** 2RSS*P21B

2RSS*P21B
MOP CURVE



MOP PT. IS AT 260 FT AT 3500 GPM AND IS DERIVED FROM SWEC CALC. 12241-US(B)-193-0 (2/18/93), (REFERENCE LETTER 2DLS-28716, DATED 8/7/86).

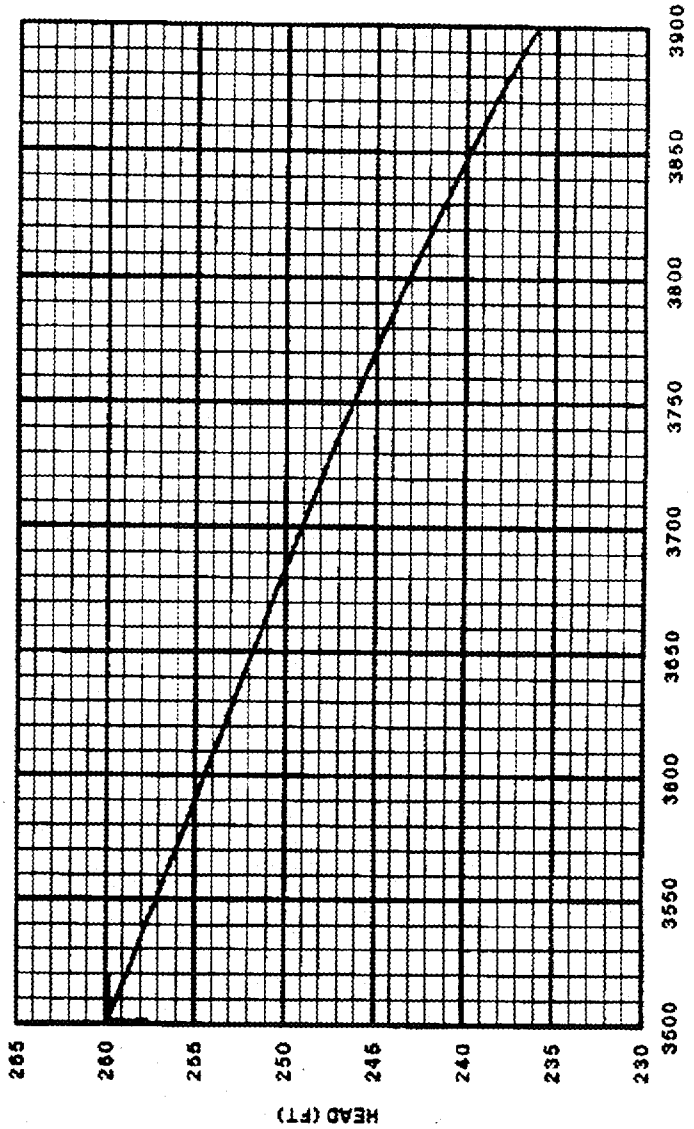
MOP CURVE SUPPLIED BY ENGINEERING PER EM 63835 (3/14/89).

Pump Name: 21C Recirculation Spray Pump **Pump Number:** 2RSS*P21C

2RSS*P21C
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
3500	260
3550	257
3600	254.5
3650	252
3700	249
3750	246.3
3800	243
3850	240
3900	236



MOP PT. IS AT 260 FT AT 3500 GPM AND IS DERIVED FROM SWEC CALC. 12241-US(B)-193-0 (2/18/93), (REFERENCE LETTER 2BLS-28716, DATED 8/7/86).

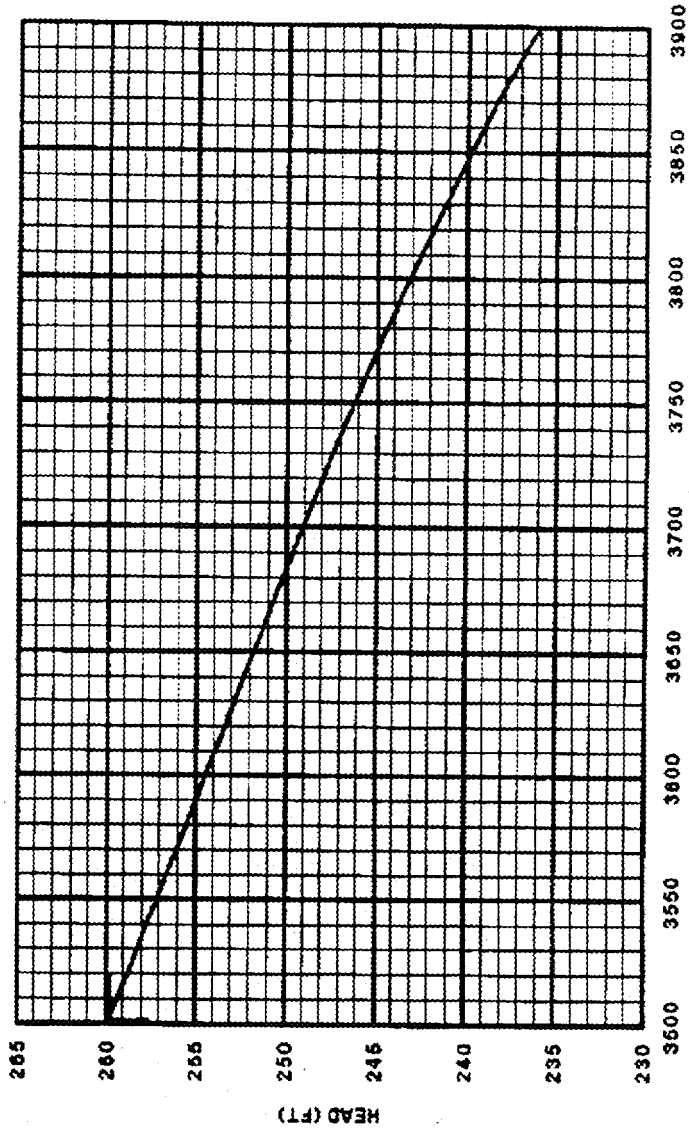
MOP CURVE SUPPLIED BY ENGINEERING PER EM 63835 (3/14/89).

Pump Name: 21C Recirculation Spray Pump **Pump Number:** 2RSS*P21C

2RSS*P21C
MOP CURVE

MOP CURVE DATA POINTS:

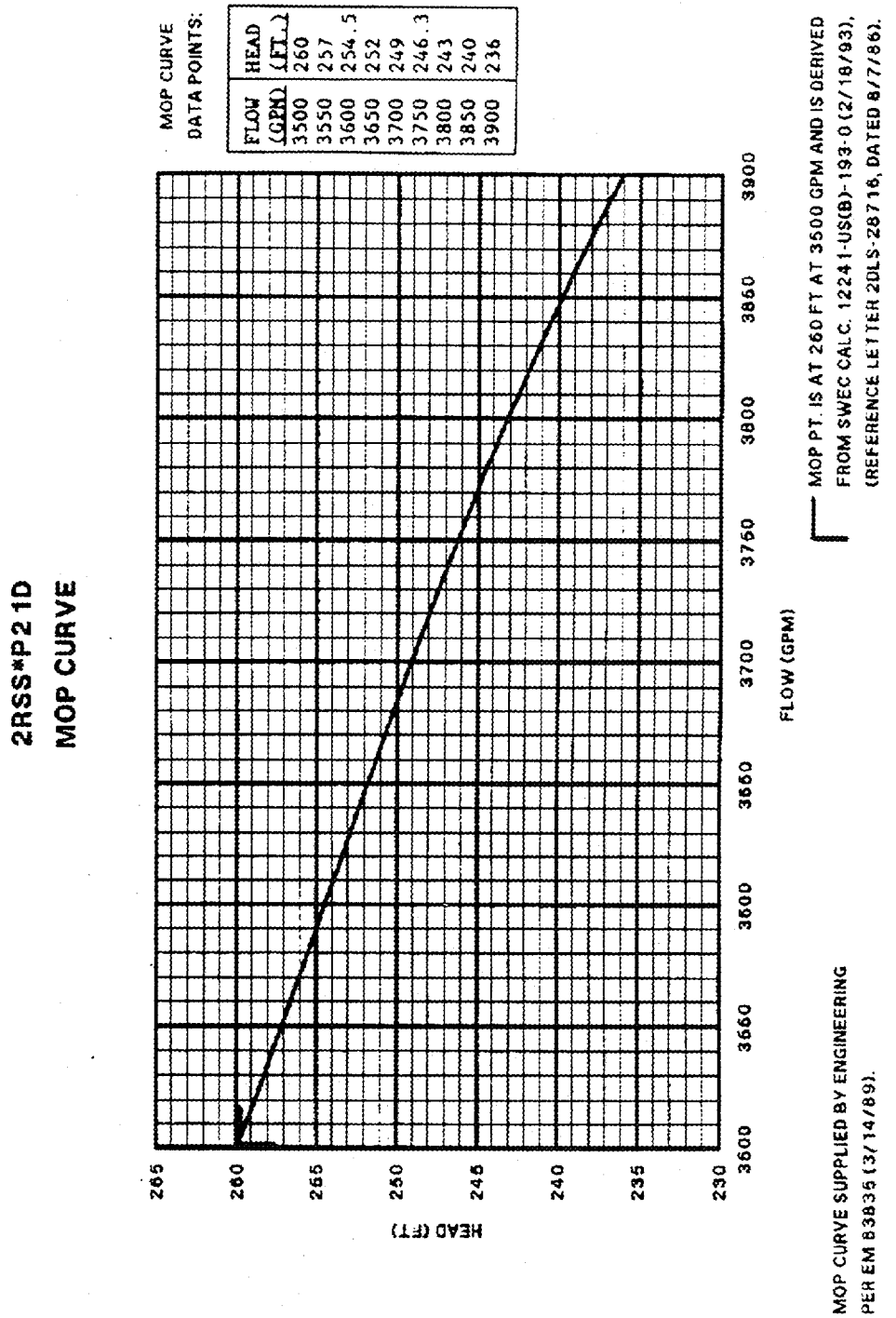
FLOW (GPM)	HEAD (FT.)
3500	260
3550	257
3600	254.5
3650	252
3700	249
3750	246.3
3800	243
3850	240
3900	236



MOP PT. IS AT 260 FT AT 3500 GPM AND IS DERIVED FROM SWEC CALC. 12241-US(B)-193-0 (2/18/93), (REFERENCE LETTER 2BLS-28716, DATED 8/7/86).

MOP CURVE SUPPLIED BY ENGINEERING PER EM 63835 (3/14/89).

Pump Name: 21D Recirculation Spray Pump **Pump Number:** 2RSS*P21D

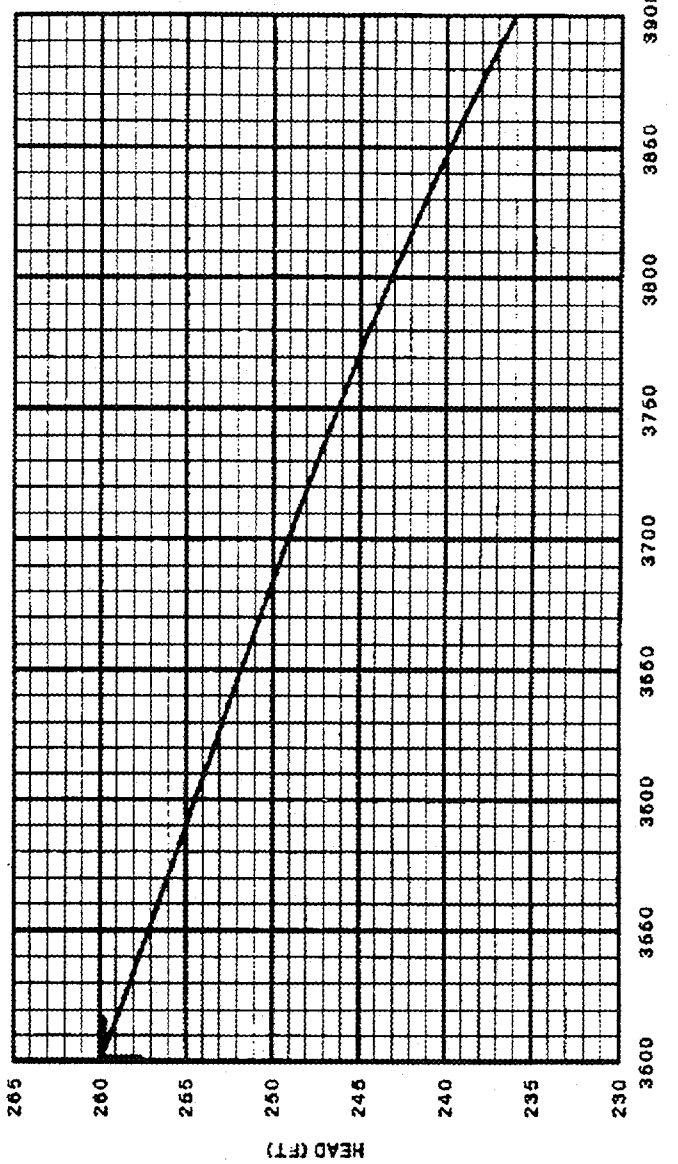


Pump Name: 21D Recirculation Spray Pump **Pump Number:** 2RSS*P21D

2RSS*P21D
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
3500	260
3550	257
3600	254.5
3650	252
3700	249
3750	246.3
3800	243
3850	240
3900	236

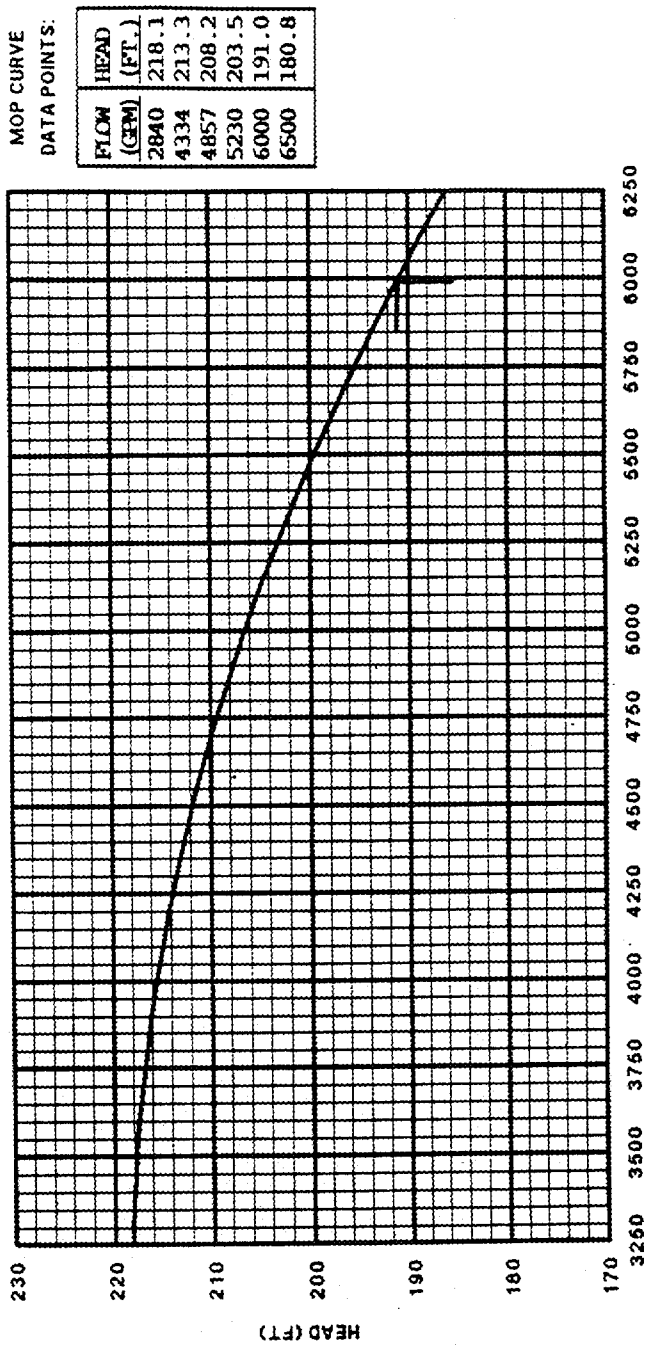


MOP PT. IS AT 260 FT AT 3500 GPM AND IS DERIVED FROM SWEC CALC. 12241-US(B)-193-0 (2/18/93), (REFERENCE LETTER 2DLS-28716, DATED 8/7/86).

MOP CURVE SUPPLIED BY ENGINEERING PER EM 83835 (3/14/89).

Pump Name: 21A Component Cooling Water Pump **Pump Number:** 2CCP*P21A

2CCP*P21A
MOP CURVE

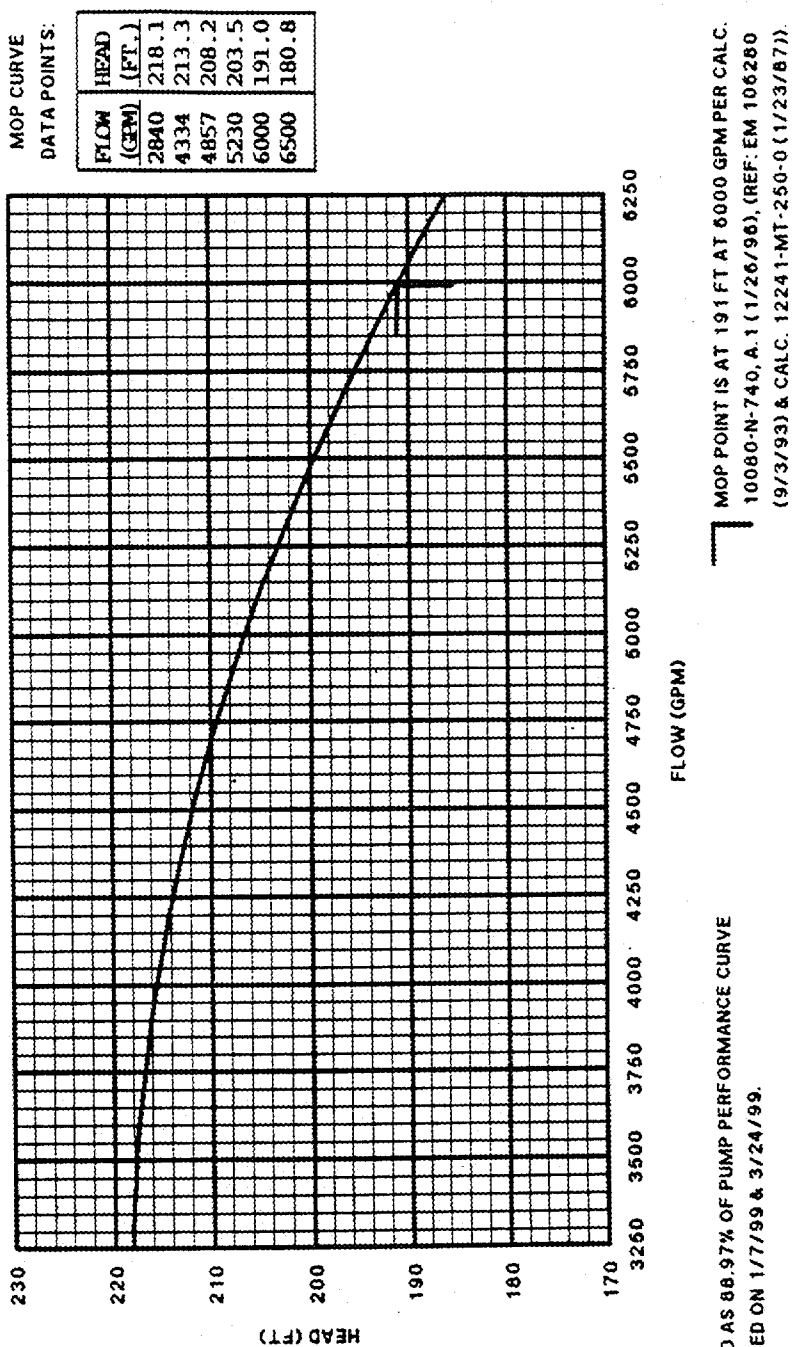


MOP POINT IS AT 191 FT AT 6000 GPM PER CALC. 10080-N-740, A.1 (1/26/96), (REF: EM 106280 (9/3/93) & CALC. 12241-MT-250-0 (1/23/87)).

DERIVED AS 88.97% OF PUMP PERFORMANCE CURVE OBTAINED ON 1/7/99 & 3/24/99.

Pump Name: 21A Component Cooling Water Pump **Pump Number:** 2CCP*P21A

2CCP*P21A
MOP CURVE

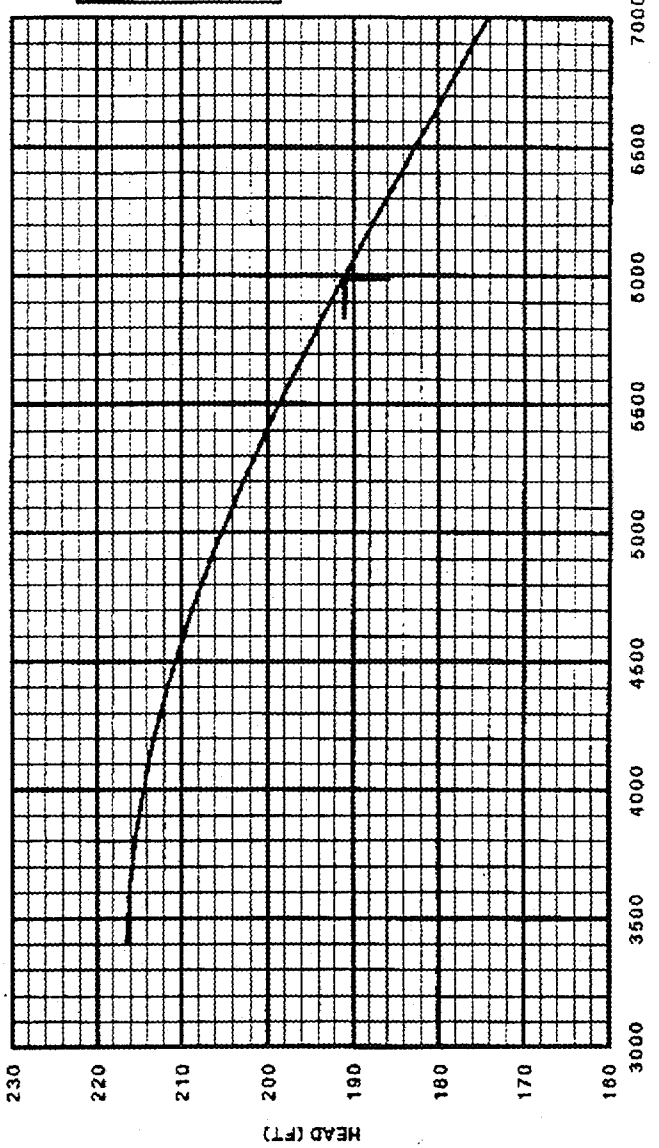


Pump Name: 21B Component Cooling Water Pump **Pump Number:** 2CCP*P21B

2CCP*P21B
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
3400	216.4
4010	214.5
5001	205.3
6000	191.0
7135	171.9



MOP POINT IS AT 191 FT AT 6000 GPM PER CALC. 10080-N-740, A 1 (1/26/96), (REF: EM 106200 (9/3/93) & CALC. 12241-MT-250-0 (1/23/87)).

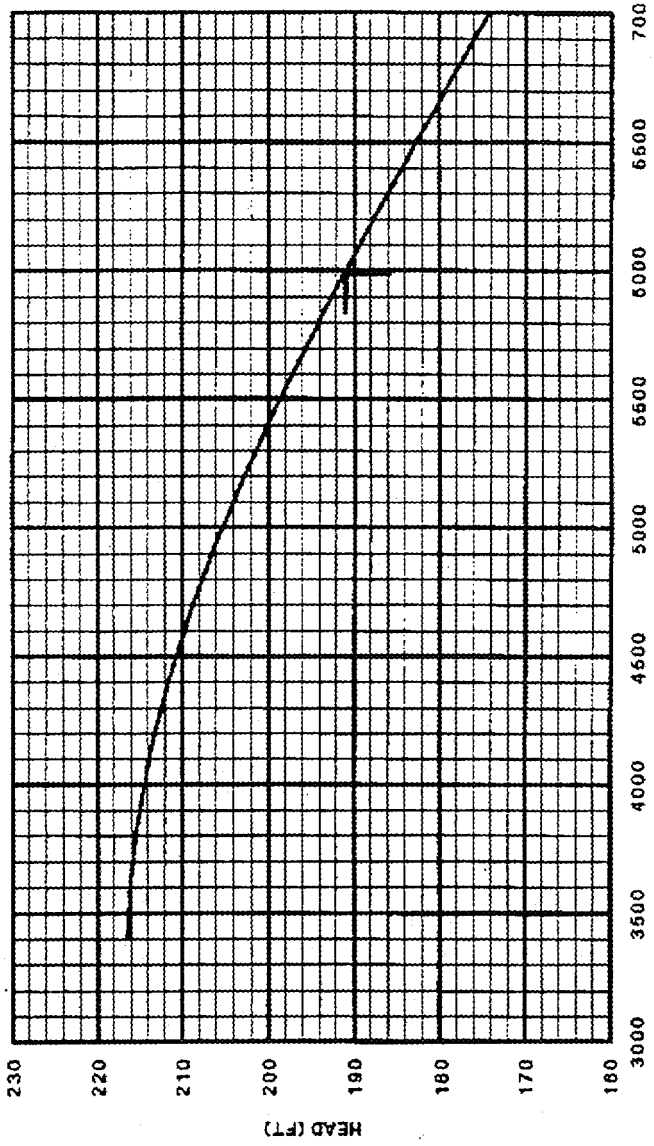
DERIVED AS 86.51% OF PUMP PERFORMANCE CURVE OBTAINED ON 1/16/97.

Pump Name: 21B Component Cooling Water Pump **Pump Number:** 2CCP*P21B

2CCP*P21B
MOP CURVE

MOP CURVE DATA POINTS:

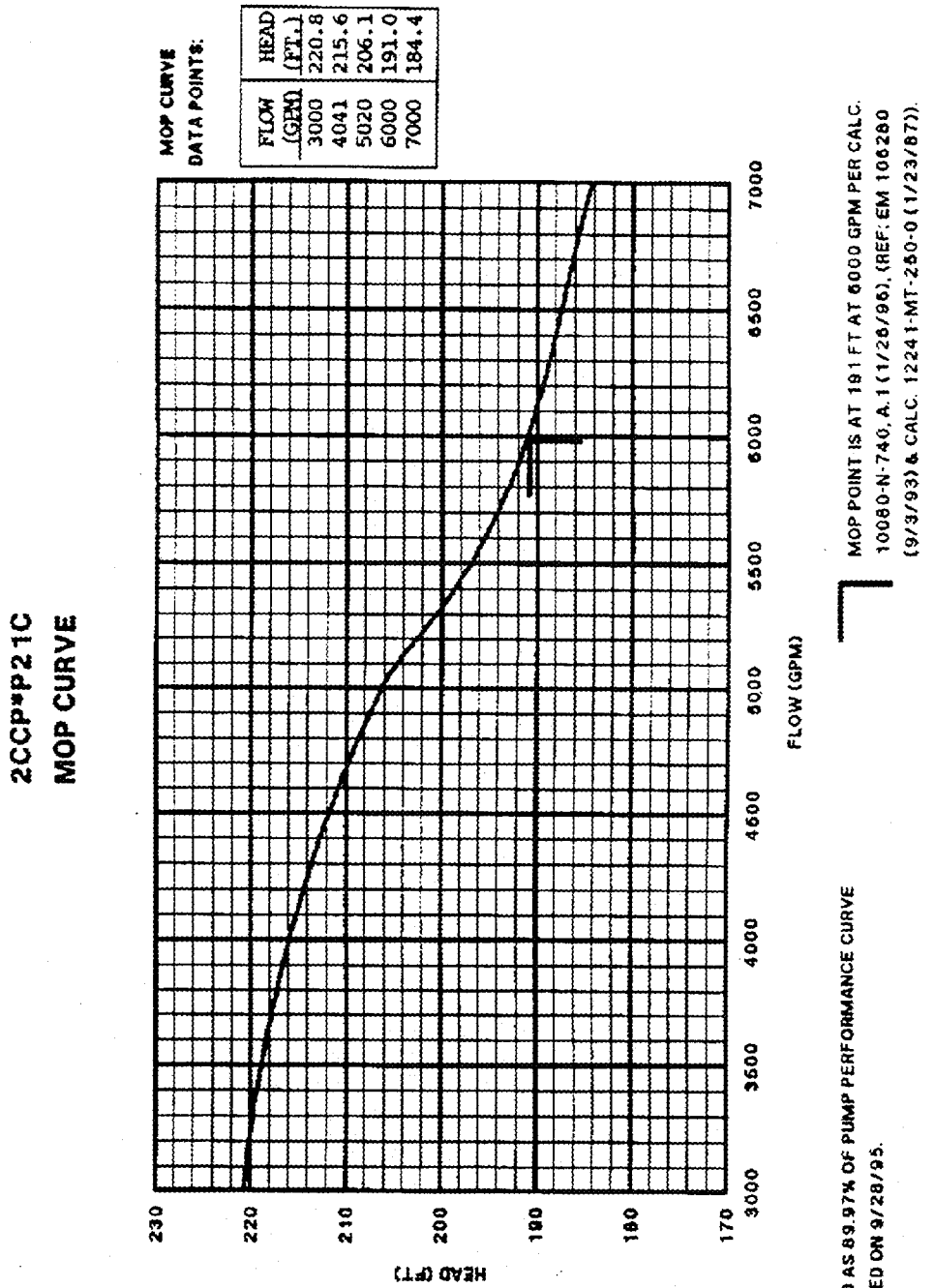
FLOW (GPM)	HEAD (FT.)
3400	216.4
4010	214.5
5001	205.3
6000	191.0
7135	171.9



MOP POINT IS AT 191 FT AT 6000 GPM PER CALC. 10080-N-740, A 1 (1/26/96), (REF: EM 106200 (9/3/93) & CALC. 12241-MT-250-0 (1/23/87)).

DERIVED AS 86.51% OF PUMP PERFORMANCE CURVE OBTAINED ON 1/16/97.

Pump Name: 21C Component Cooling Water Pump **Pump Number:** 2CCP*P21C

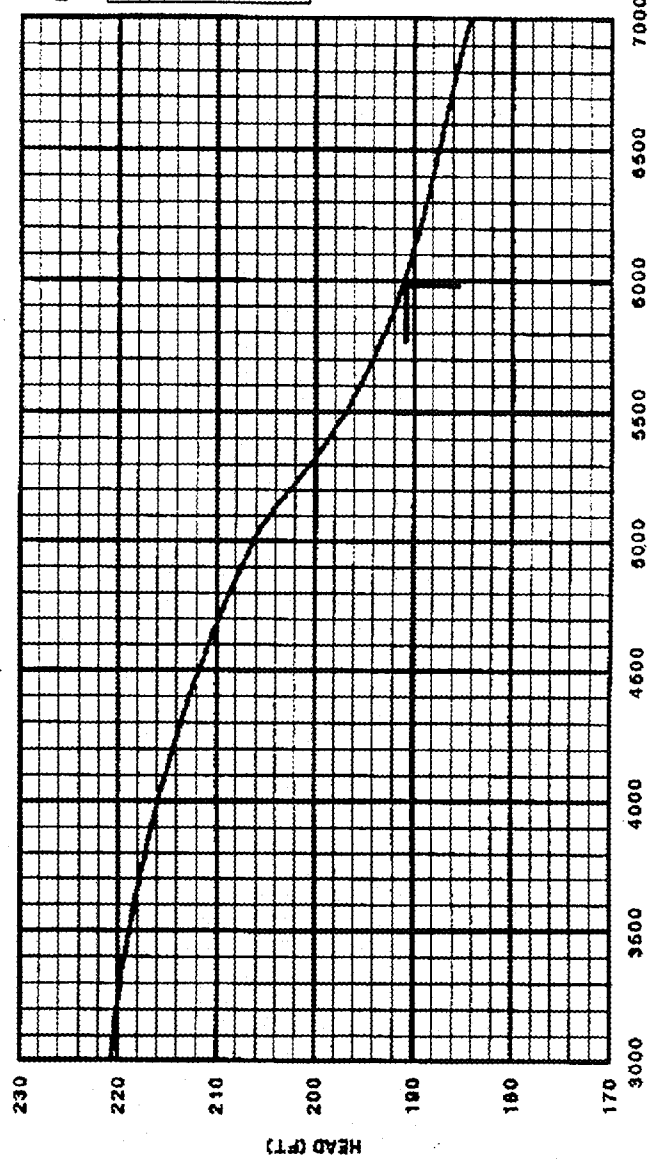


Pump Name: 21C Component Cooling Water Pump **Pump Number:** 2CCP*P21C

2CCP*P21C
MOP CURVE

MOP CURVE
DATA POINTS:

FLOW (GPM)	HEAD (FT.)
3000	220.8
4041	215.6
5020	206.1
6000	191.0
7000	184.4



MOP POINT IS AT 191 FT AT 6000 GPM PER CALC. 10080-N-740, A.1 (1/26/96), (REF: EM 106280 (9/3/93) & CALC. 12241-MT-250-0 (1/23/87)).

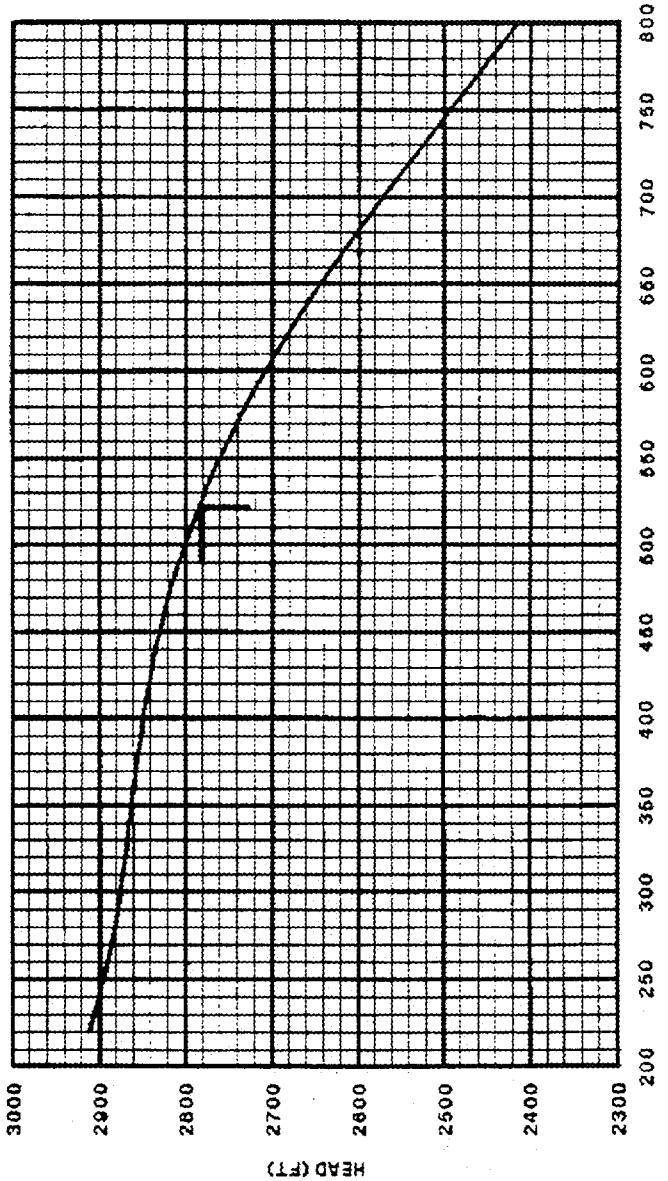
DERIVED AS 89.97% OF PUMP PERFORMANCE CURVE OBTAINED ON 9/28/95.

Pump Name: Turbine Driven Auxiliary Feedwater Pump **Pump Number:** 2FWE*P22

2FWE*P22
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
220	2911
255	2892
300	2876
400	2850
500	2801
600	2709
700	2572
800	2415



MOP POINT IS AT 2785 FT AT 521.5 GPM PER CALCULATION 10080-N-684, REV 0 (8/17/93).

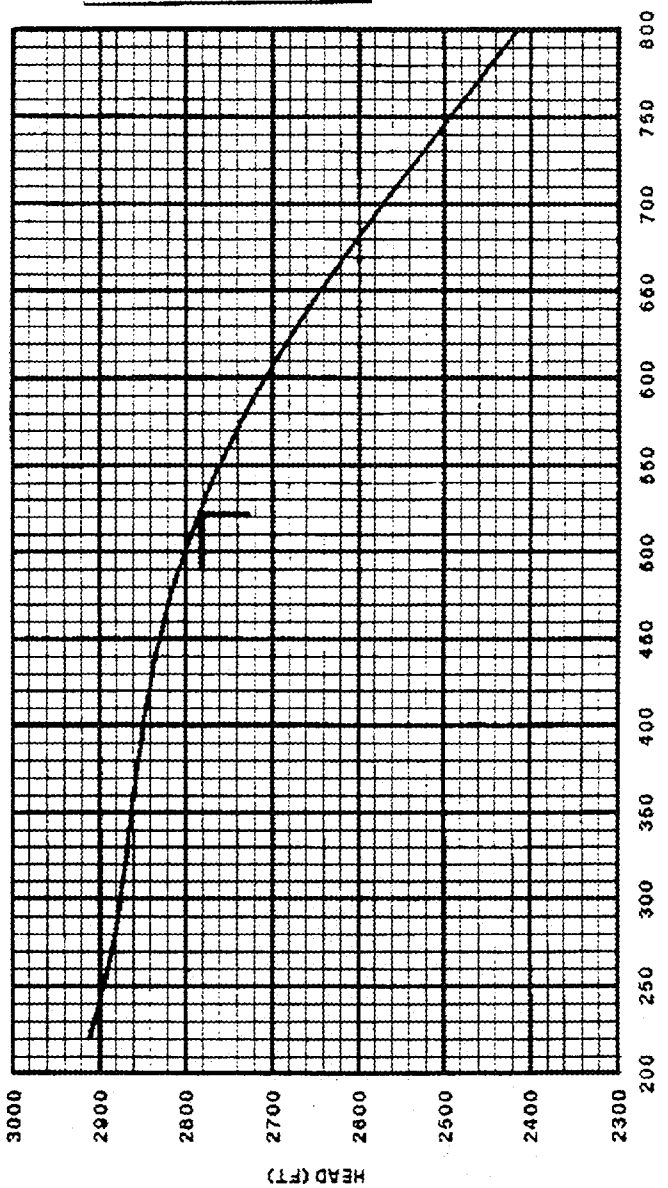
DERIVED AS 94.62% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 5/7/92 (REF: EM 106208 (9/30/93)).

Pump Name: Turbine Driven Auxiliary Feedwater Pump **Pump Number:** 2FWE*P22

2FWE*P22
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
220	2911
255	2892
300	2876
400	2850
500	2801
600	2709
700	2572
800	2415



MOP POINT IS AT 2785 FT AT 521.5 GPM PER CALCULATION 10080-N-684, REV 0 (8/17/93).

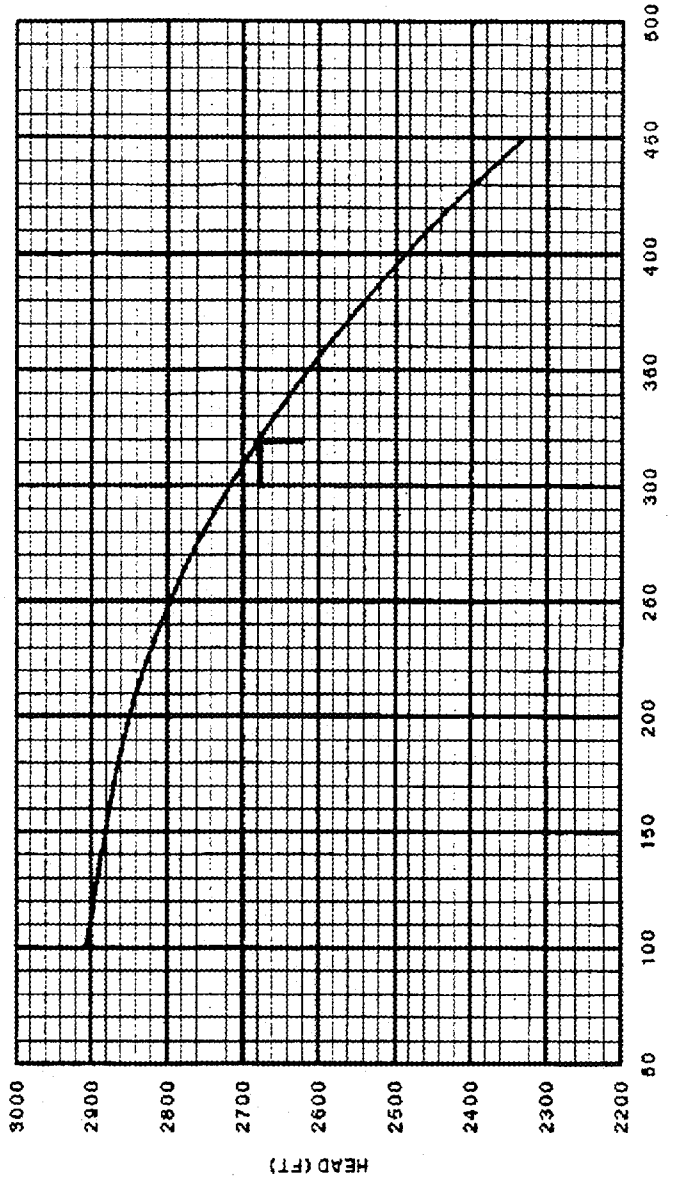
DERIVED AS 94.62% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 5/7/92 (REF: EM 106208 (9/30/93)).

Pump Name: 23A Motor Driven Auxiliary Feedwater Pump **Pump Number:** 2FWE*P23A

2FWE*P23A
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
100	2908
150	2882
200	2849
250	2796
300	2716
319	2680
350	2613
400	2486
450	2330



MOP POINT IS AT 2680 FT AT 319 GPM PER CALCULATION 10080-N-584, REV.0 (8/17/93).

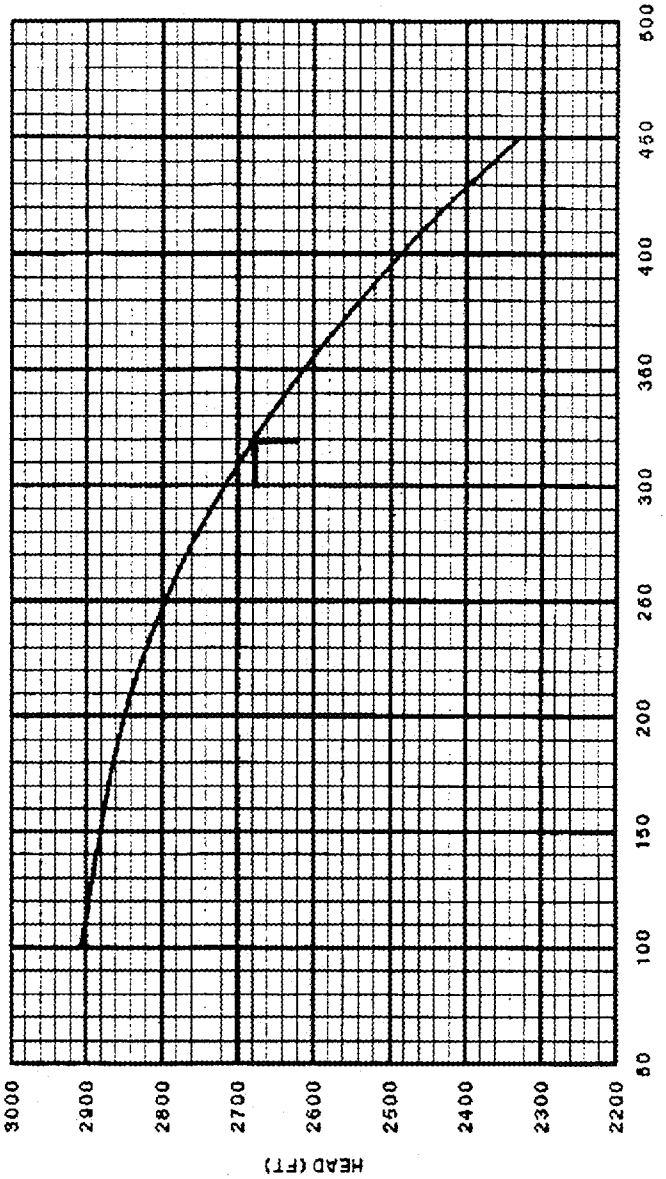
DRIVED AS 95.84% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 5/2/92 (REF: EM 106208 (9/30/93)).

Pump Name: 23A Motor Driven Auxiliary Feedwater Pump **Pump Number:** 2FWE*P23A

2FWE*P23A
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
100	2908
150	2882
200	2849
250	2796
300	2716
319	2680
350	2613
400	2486
450	2330



MOP POINT IS AT 2680 FT AT 319 GPM PER CALCULATION 10080-N-884, REV.0 (8/17/93).

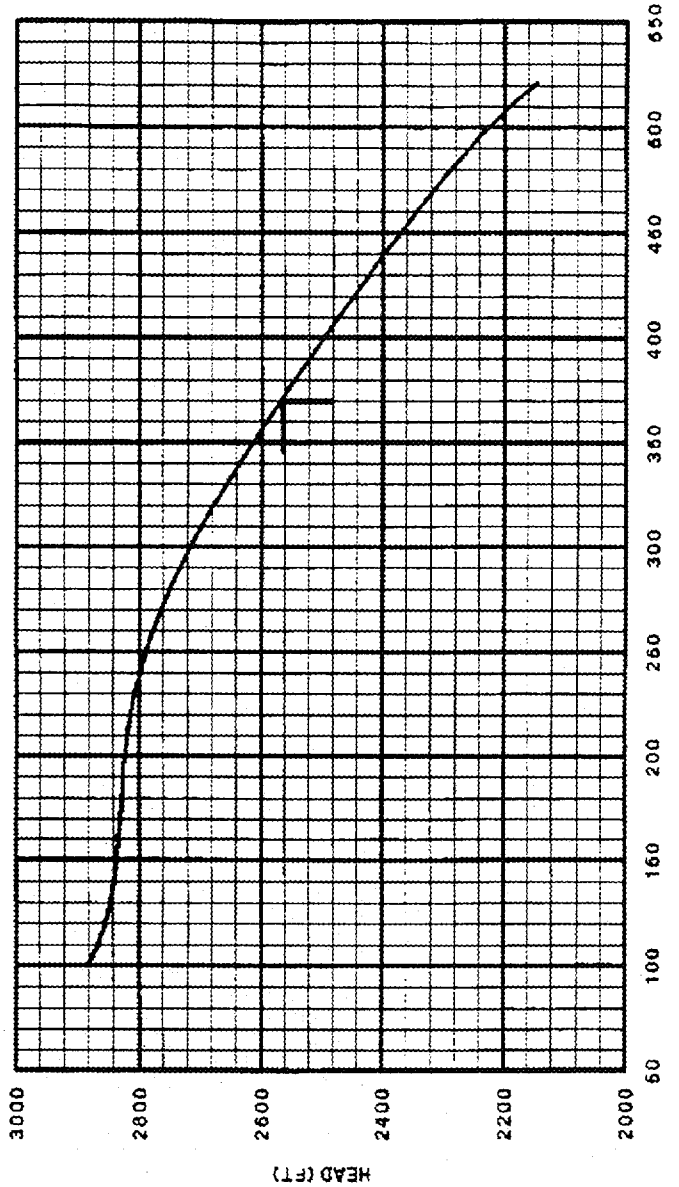
DRIVED AS 95.84% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 5/2/92 (REF: EM 106208 (9/30/93)).

Pump Name: 23B Motor Driven Auxiliary Feedwater Pump **Pump Number:** 2FWE*P23B

2FWE*P23B
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
100	2883
152	2836
203	2822
255	2783
319	2680
349	2615
401	2493
452	2364
521	2147



MOP POINT IS AT 2680 FT AT 319 GPM PER CALCULATION 10080-N-684, REV.0 (8/17/93).

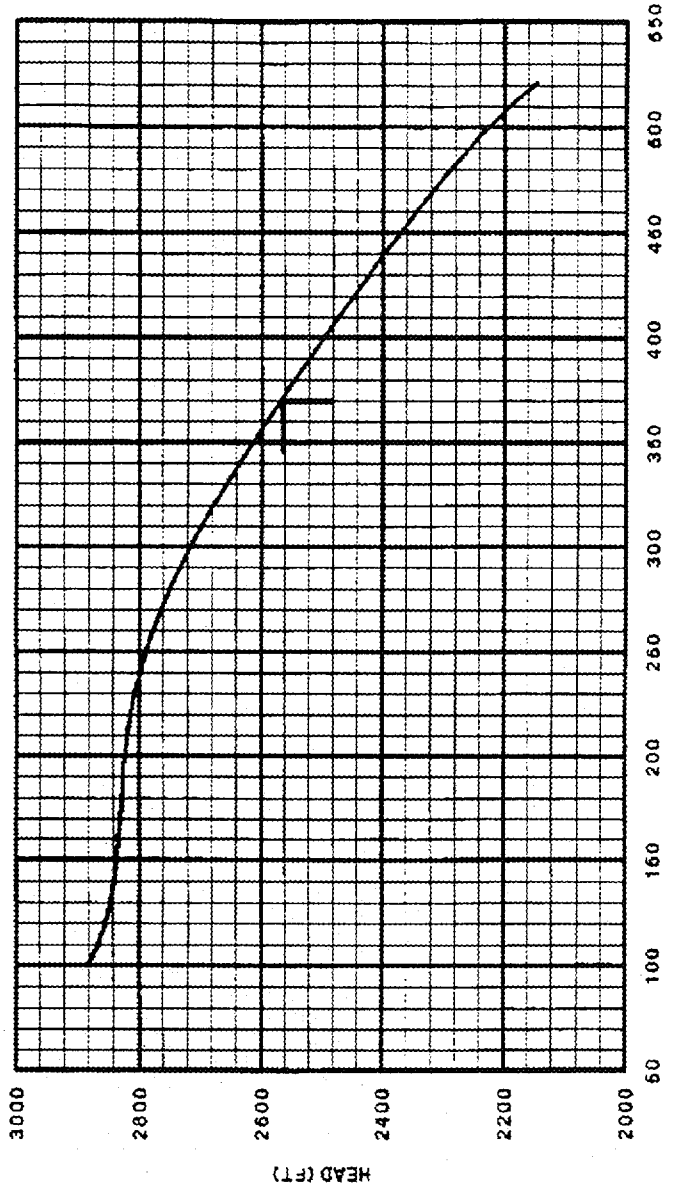
DERIVED AS 94.98% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 11/12/80 (REF: EM 106208 (9/30/93)).

Pump Name: 23B Motor Driven Auxiliary Feedwater Pump **Pump Number:** 2FWE*P23B

2FWE*P23B
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
100	2883
152	2836
203	2822
255	2783
319	2680
349	2615
401	2493
452	2364
521	2147

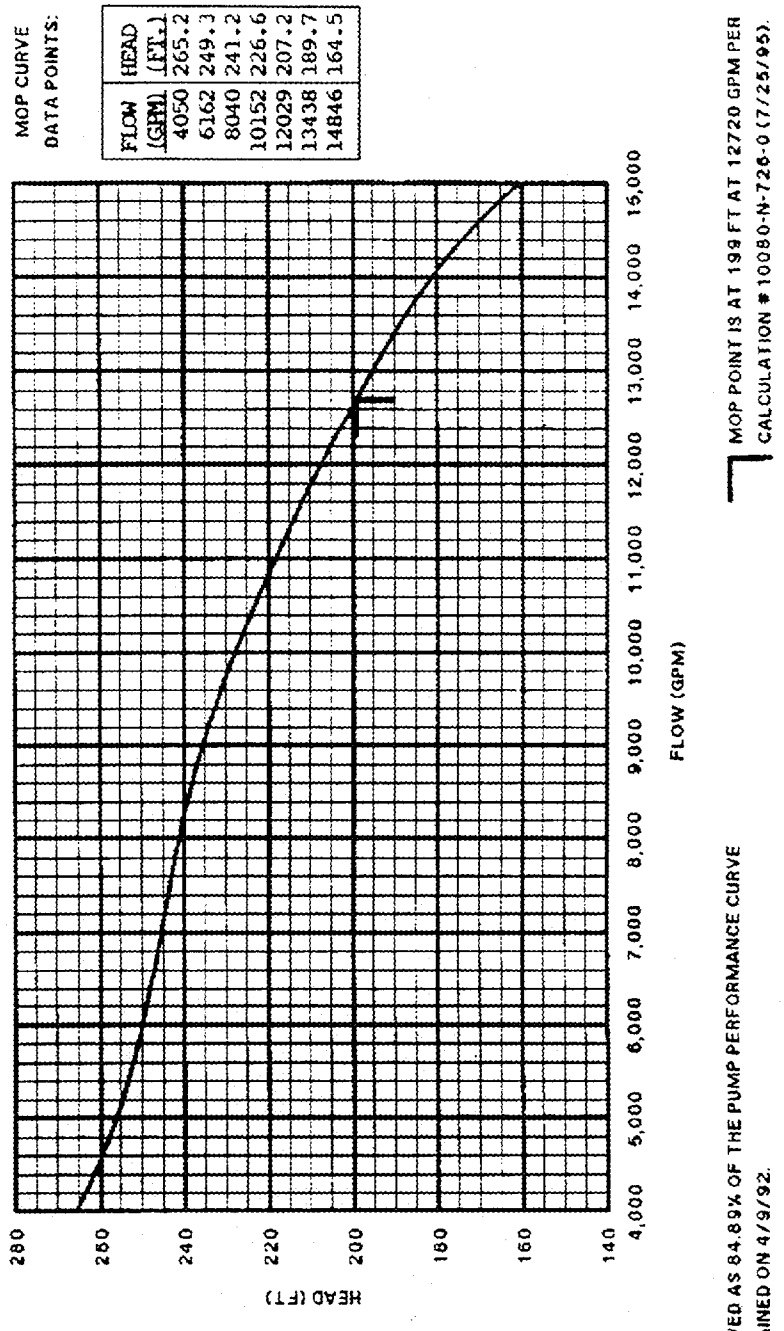


MOP POINT IS AT 2680 FT AT 319 GPM PER CALCULATION 10080-N-684, REV.0 (8/17/93).

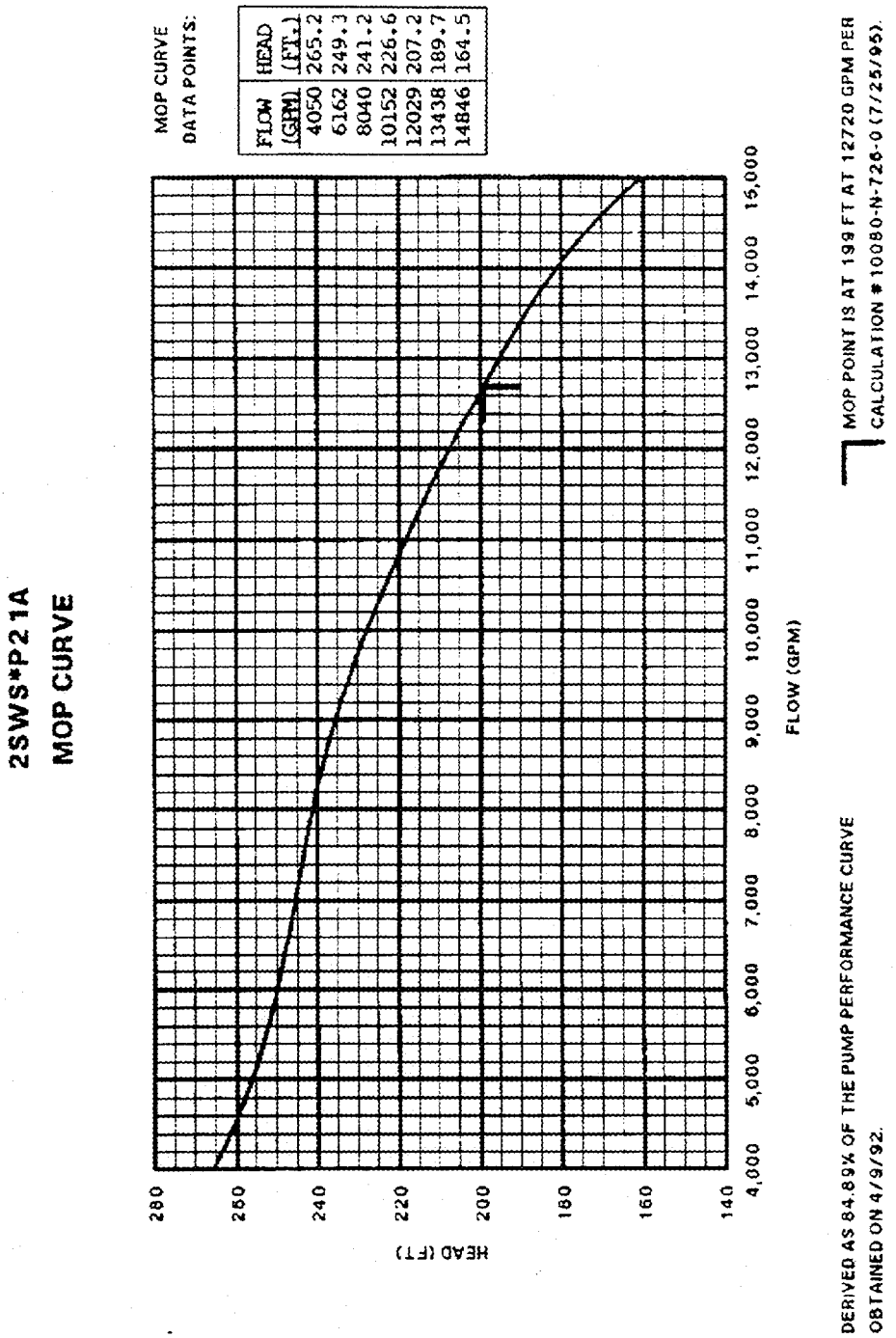
DERIVED AS 94.98% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 11/12/90 (REF: EM 106208 (9/30/93)).

Pump Name: 21A Service Water Pump **Pump Number:** 2SWS*P21A

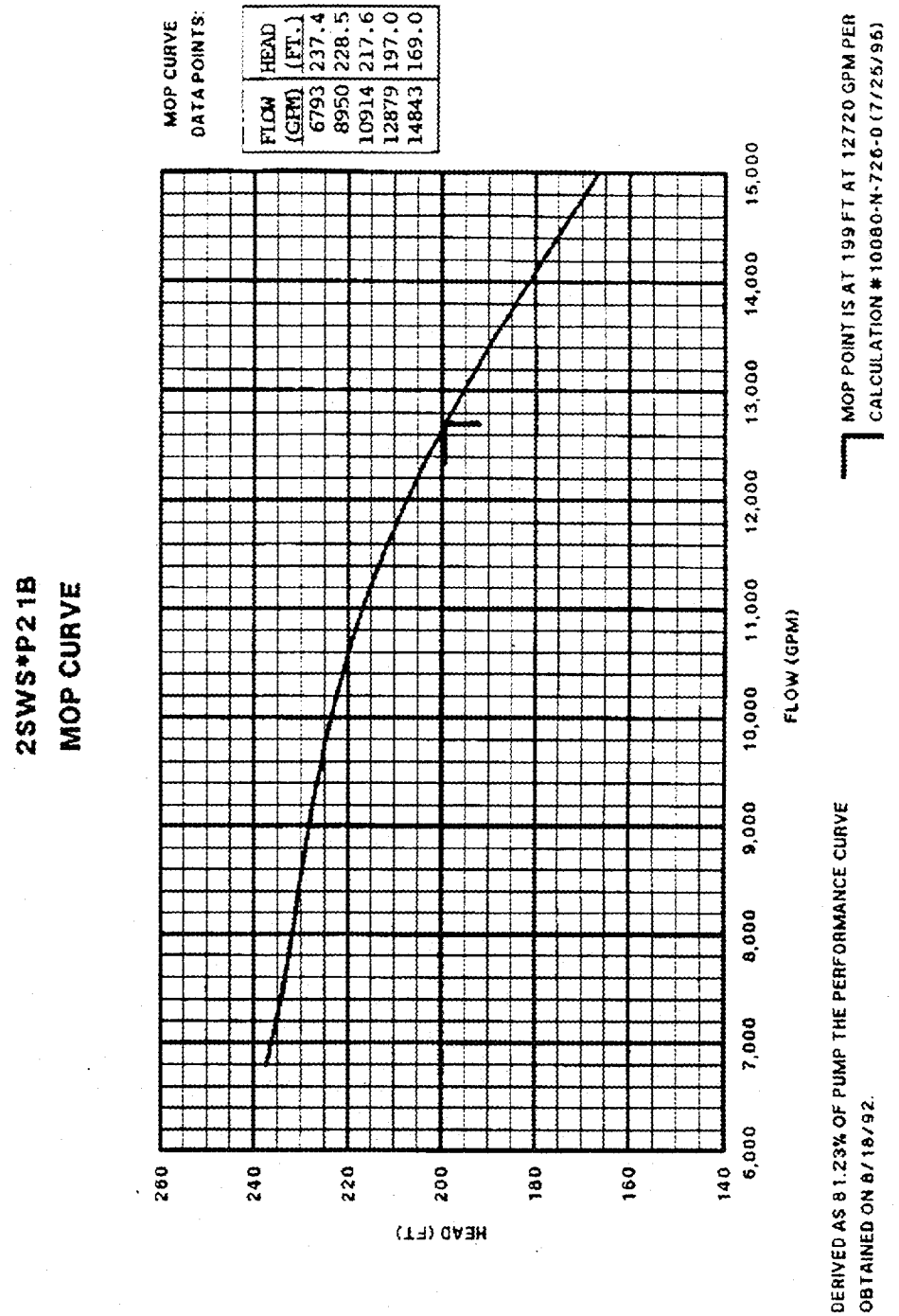
2SWS*P21A
MOP CURVE



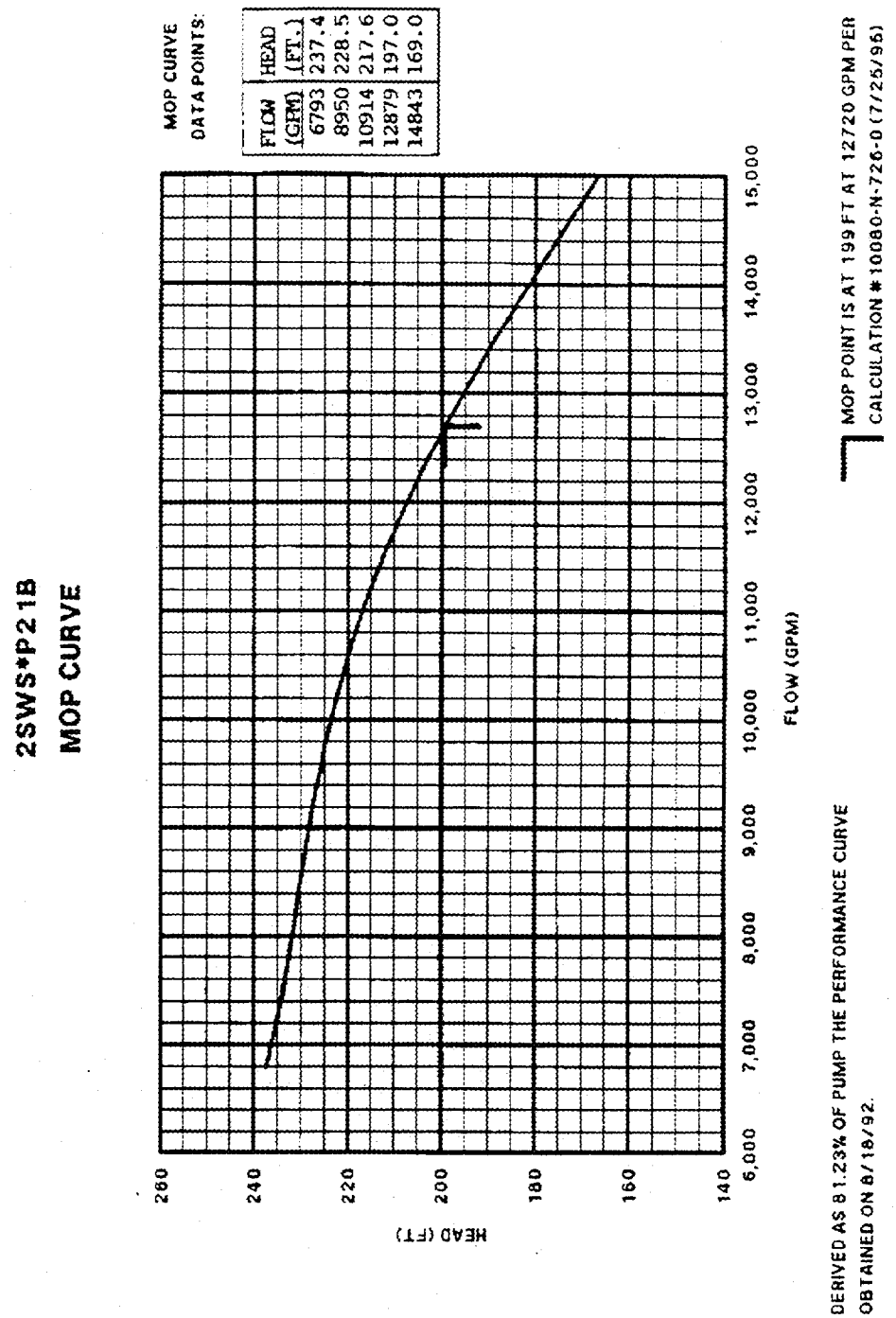
Pump Name: 21A Service Water Pump **Pump Number:** 2SWS*P21A



Pump Name: 21B Service Water Pump **Pump Number:** 2SWS*P21B

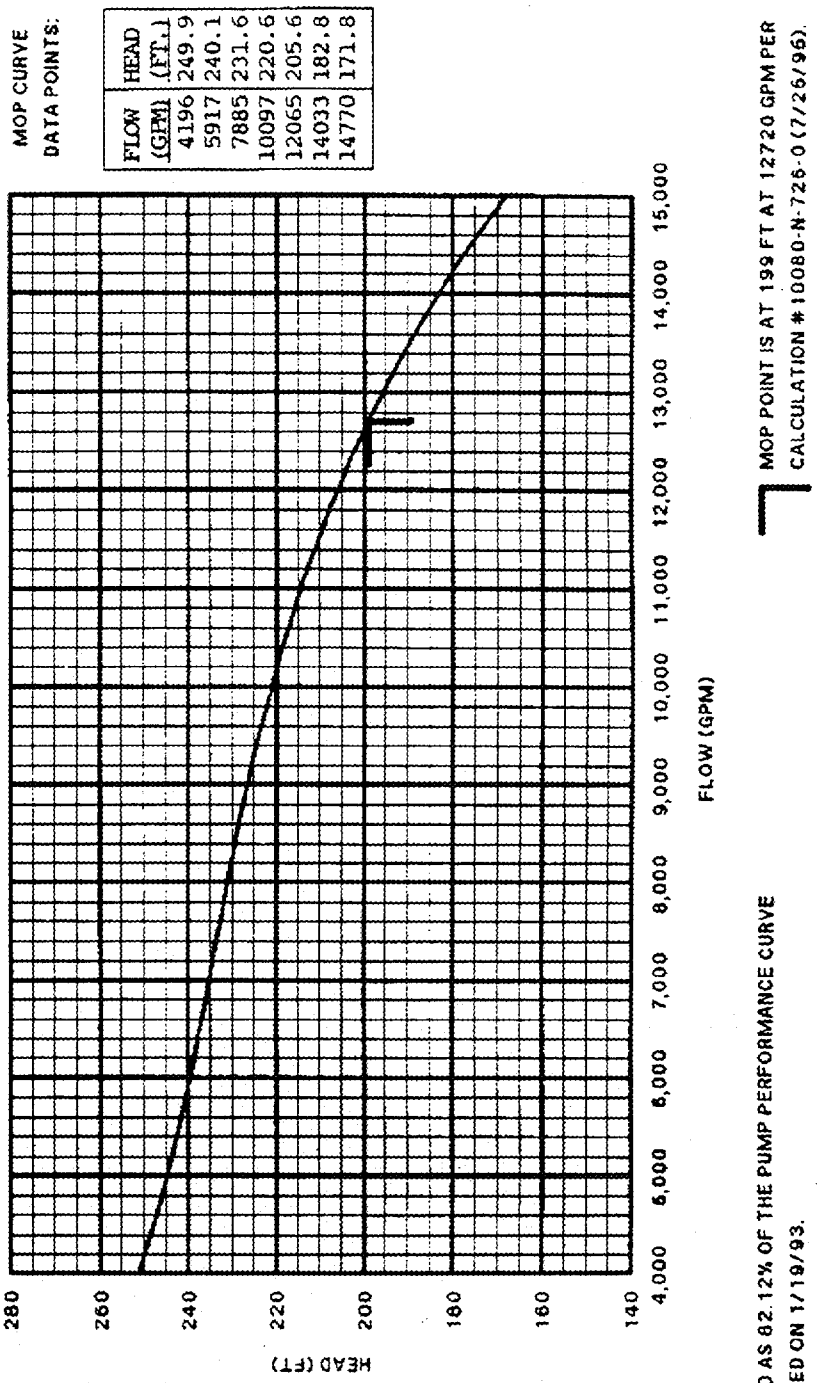


Pump Name: 21B Service Water Pump **Pump Number:** 2SWS*P21B



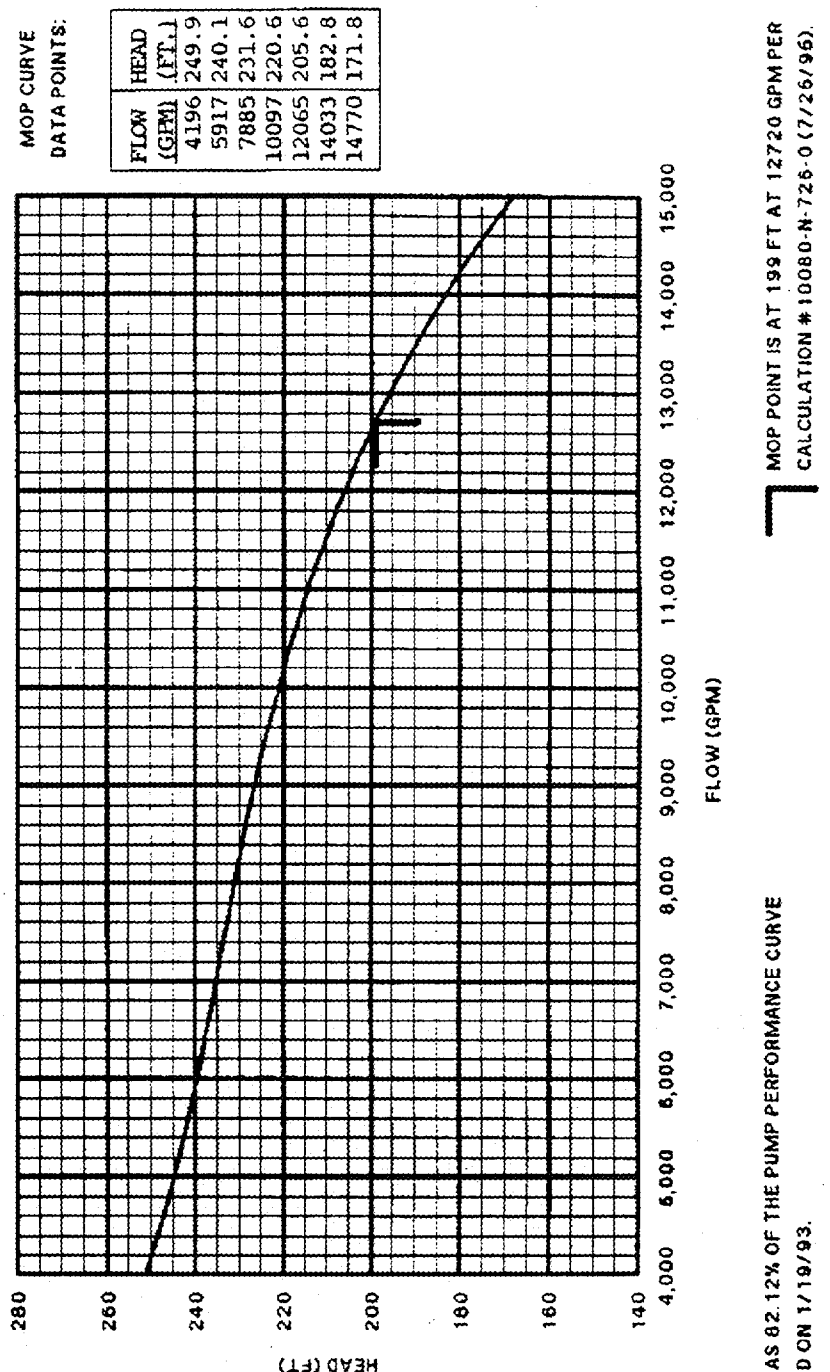
Pump Name: 21C Service Water Pump **Pump Number:** 2SWS*P21C

2SWS*P21C
MOP CURVE



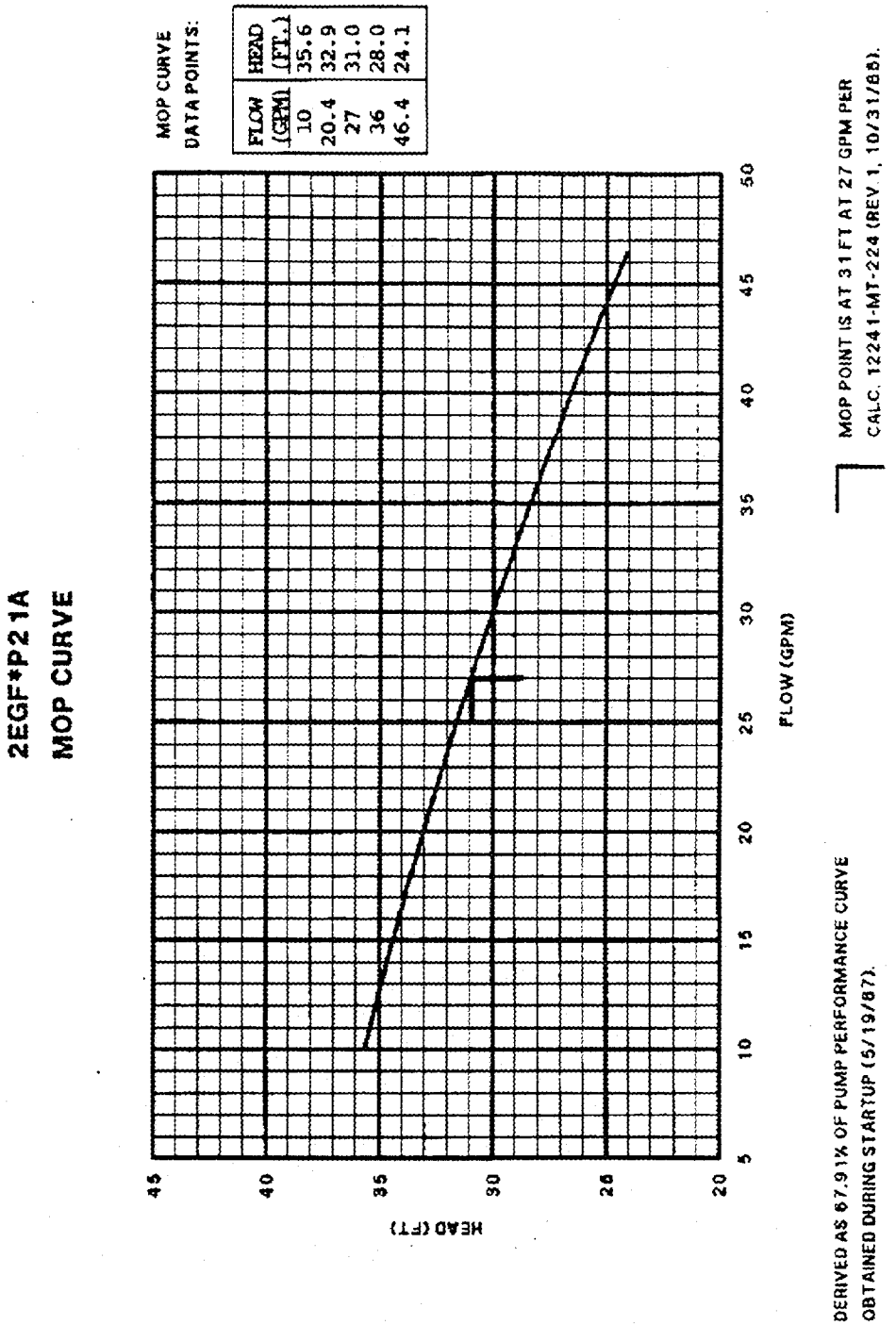
Pump Name: 21C Service Water Pump **Pump Number:** 2SWS*P21C

2SWS*P21C
MOP CURVE



DERIVED AS 82.12% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 1/19/93.

Pump Name: 21A Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21A

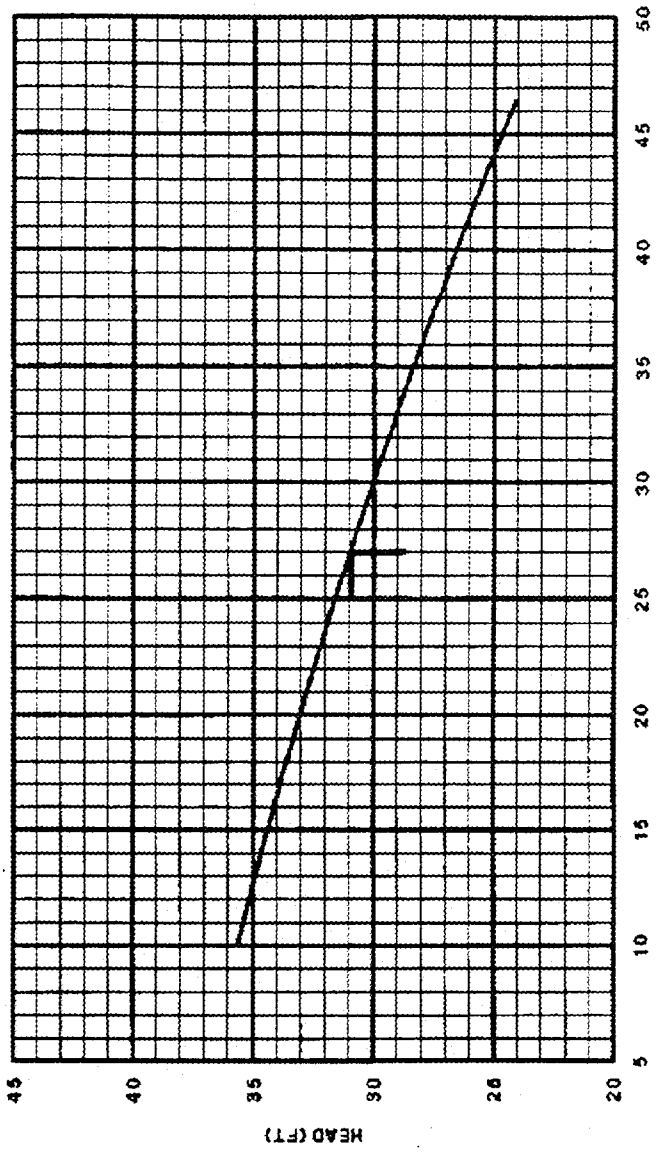


Pump Name: 21A Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21A

2EGF*P21A
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
10	35.6
20.4	32.9
27	31.0
36	28.0
46.4	24.1

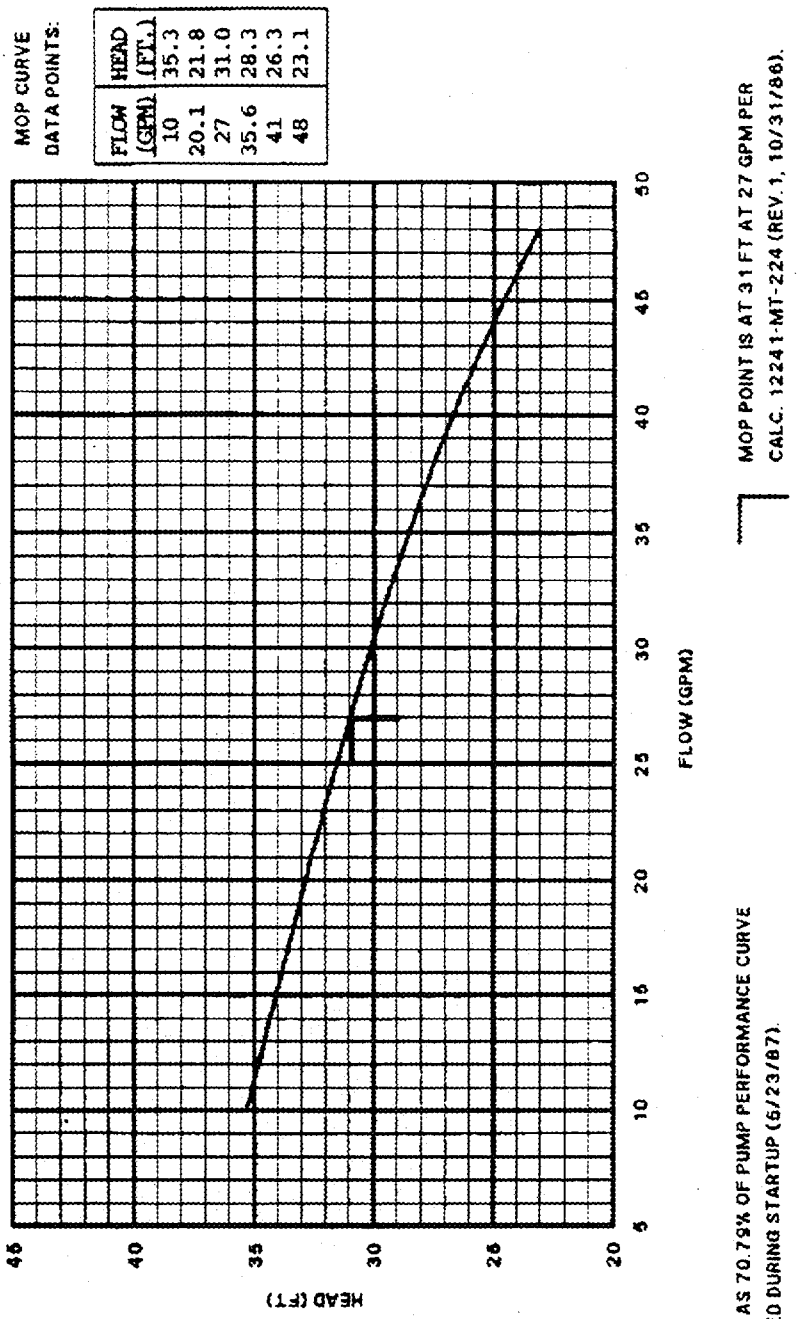


MOP POINT IS AT 31 FT AT 27 GPM PER CALC. 12241-MT-224 (REV 1, 10/31/88).

DERIVED AS 67.91% OF PUMP PERFORMANCE CURVE OBTAINED DURING STARTUP (5/19/87).

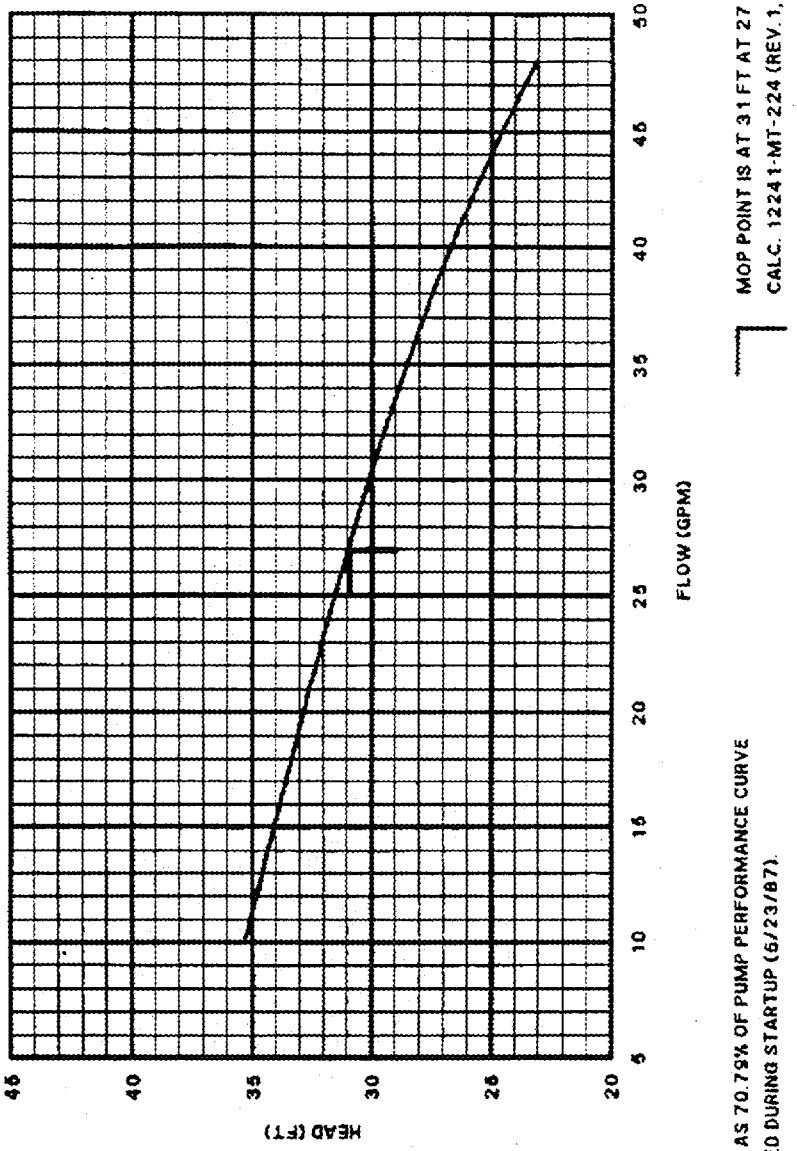
Pump Name: 21B Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21B

2EGF*P21B
MOP CURVE



Pump Name: 21B Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21B

2EGF*P21B
MOP CURVE

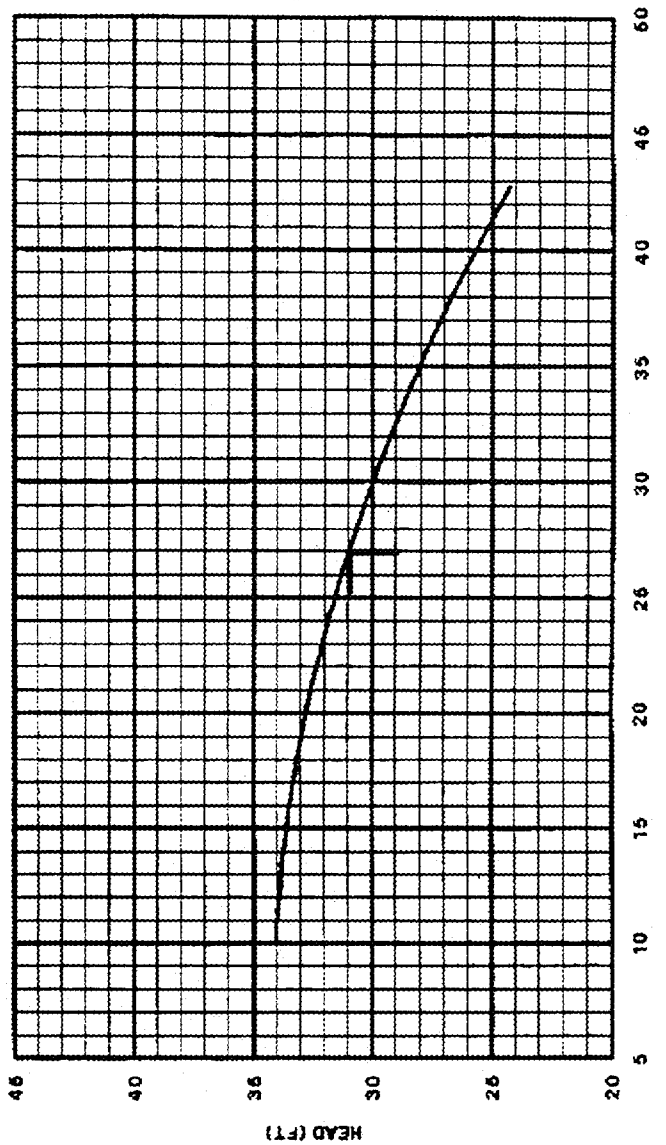


Pump Name: 21C Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21C

2EGF*P21C
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
10	34.1
20	32.8
27	31.0
35.4	27.9
42.8	24.3

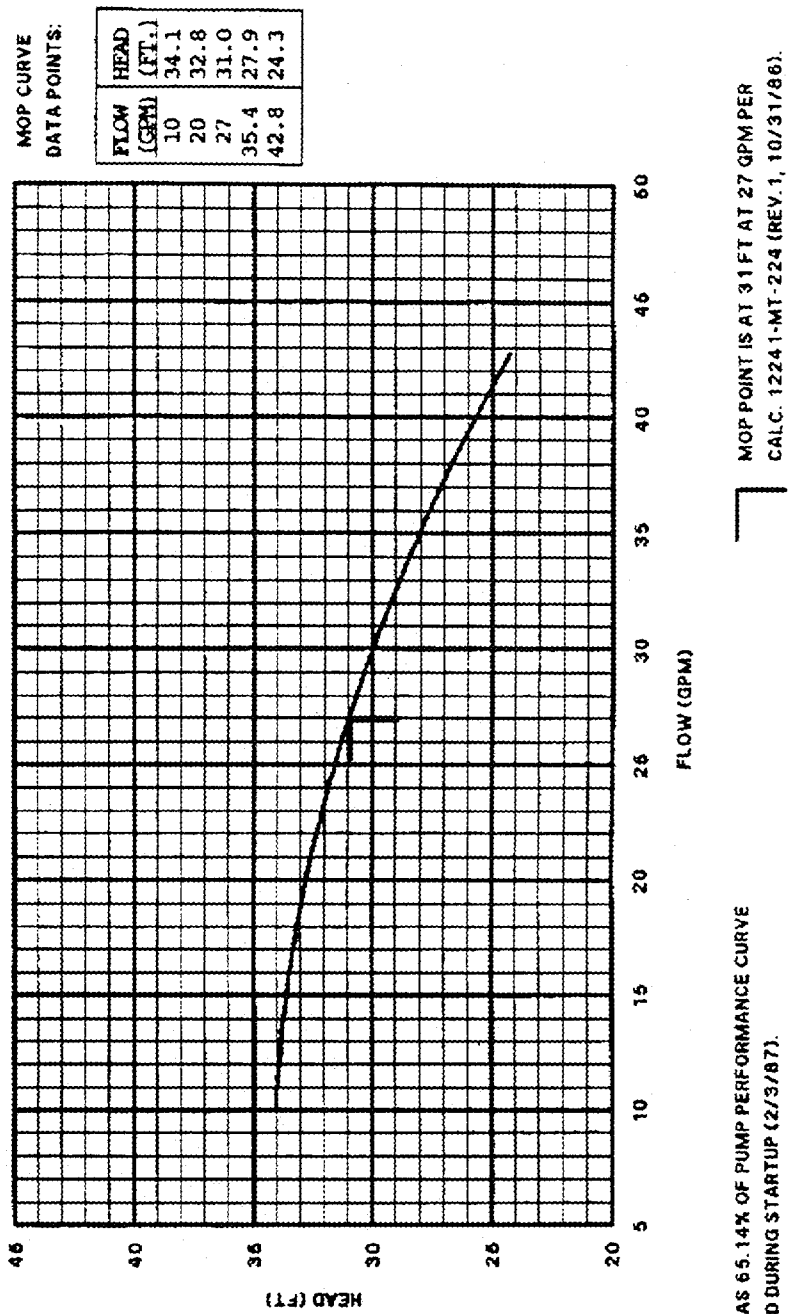


MOP POINT IS AT 31 FT AT 27 GPM PER CALC. 12241-MT-224 (REV.1, 10/31/86).

DERIVED AS 65.14% OF PUMP PERFORMANCE CURVE OBTAINED DURING STARTUP (2/3/87).

Pump Name: 21C Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21C

2EGF*P21C
MOP CURVE

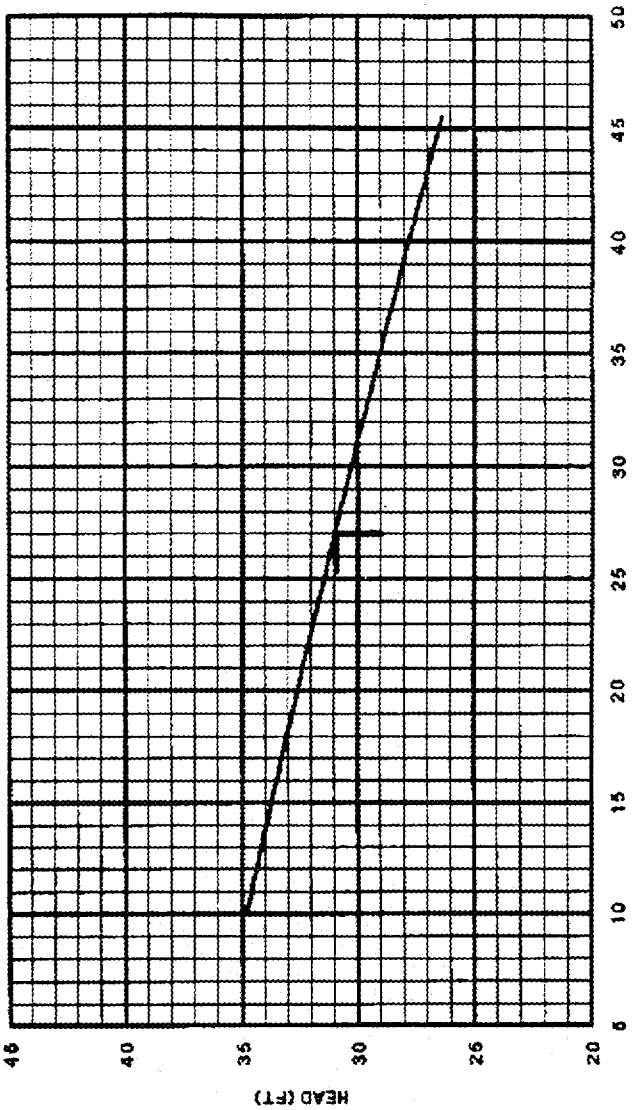


Pump Name: 21D Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21D

2EGF*P21D
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
10	34.8
20.1	32.6
27	31.0
36.1	28.8
45.5	26.4



MOP POINT IS AT 31 FT AT 27 GPM PER CALC. 12241-MT-224 (REV. 1, 10/31/86).

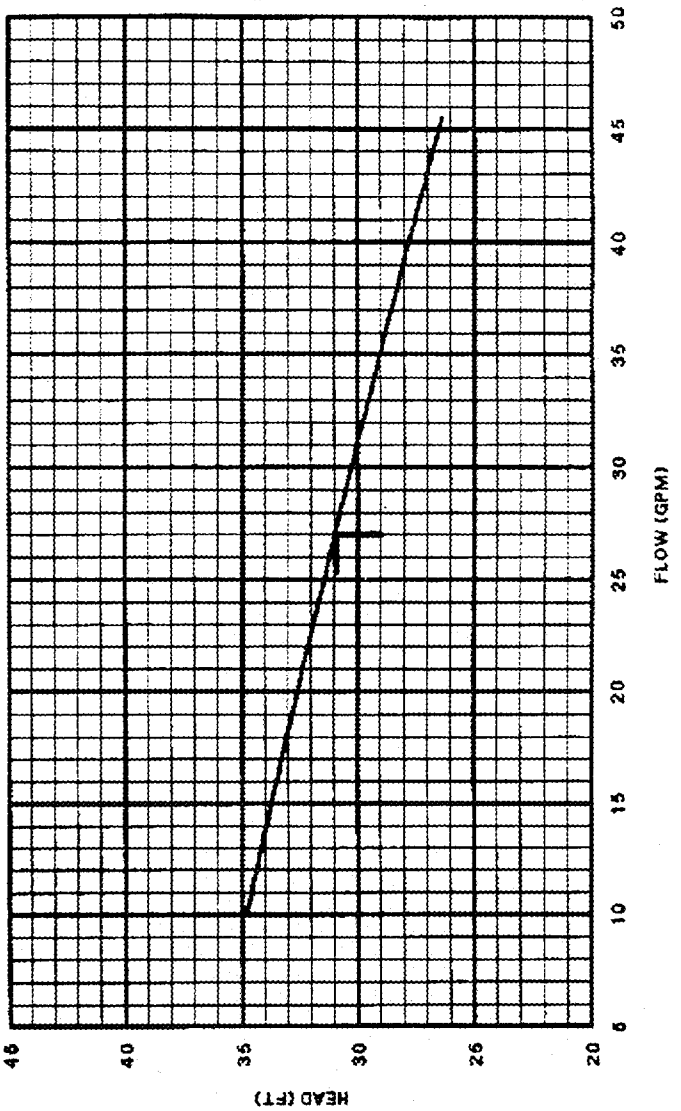
DERIVED AS 69.01% OF PUMP PERFORMANCE CURVE OBTAINED DURING STARTUP (2/4/87).

Pump Name: 21D Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21D

2EGF*P21D
MOP CURVE

MOP CURVE DATA POINTS:

FLOW (GPM)	HEAD (FT.)
10	34.8
20.1	32.6
27	31.0
36.1	28.8
45.5	26.4



MOP POINT IS AT 31 FT AT 27 GPM PER CALC. 12241-MT-224 (REV.1, 10/31/86).

DERIVED AS 69.01% OF PUMP PERFORMANCE CURVE OBTAINED DURING STARTUP (2/4/87).

SECTION VII: VALVE TESTING REQUIREMENTS

The Inservice Test (IST) Program for valves at Beaver Valley Power Station (BVPS), Unit 2, is based on the following:

- American Society of Mechanical Engineers (ASME) / American National Standards Institute (ANSI) Operational and Maintenance (OM) Standard, Part 10, "Inservice Testing of Valves in Light Water Reactor Power Plants" (OM-10), OMa-1988 addenda to the OM-1987 Edition, in accordance with the ASME Boiler and Pressure Vessel Code, Section XI, 1989 edition (the Code).
- Generic Letter No. 89-04, "Guidance on Developing Acceptable Inservice Testing Programs"
- NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants"

The valves included in this program are all ASME Class 1, 2 or 3 required to perform a specific function in shutting down a reactor to the cold shutdown condition, in maintaining the cold shutdown condition, or in mitigating the consequences of an accident. The pressure-relief devices covered are those for protecting systems or portions of systems which perform a required function in shutting down a reactor to the cold shutdown condition, in maintaining the cold shutdown condition, or in mitigating the consequences of an accident, at BVPS, Unit 2.

The requirements of the Code and Generic Letter No. 89-04 including Supplement 1 (NUREG-1482) will be followed at all times unless specific relief has been granted by the NRC.

A. Category A valves are valves for which seat leakage in the closed position is limited to a specific maximum amount for fulfillment of their function. Category B valves are valves for which seat leakage in the closed position is inconsequential for fulfillment of their function. Active Category A and B valves shall be full-stroke exercised nominally every three months to the position required to fulfill their function unless such operation is not practicable during plant operation. If only limited operation is practicable during plant operation, the valves may be part-stroke exercised during plant operation and full-stroke exercised during cold shutdowns. If exercising is not practicable during plant operation, the valves may be limited to full-stroke exercising during cold shutdowns. If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, the valves may be limited to part-stroke exercising during cold shutdowns, and full-stroke exercising during refueling outages. If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages. Exception is taken to part-stroke exercising motor-operated valves, unless specifically stated. This is necessary because the motor-operated valve circuitry prevents throttling of these valves. Under normal operation, the valves must travel to either the full open or shut position prior to reversing direction. In the case of frequent cold shutdowns, these valves need not be exercised more often than once every three months. All valve exercising required to be performed during a refueling outage shall be completed prior to returning the plant to operation. For a valve in a system declared inoperable or not required to be operable, the exercising test schedule need not be followed. Within 3 months prior to placing the system in an operable status, the valves shall be exercised and the schedule resumed.

The stroke time of all power-operated valves shall be measured to at least the nearest second. Full-stroke time is the time interval from initiation of the actuating signal to the end of the actuating stroke. The time to full-stroke exercise each power-operated valve will be measured and compared to a reference value (baseline time) and/or an ASME limiting stroke time as follows:

1. Motor-operated valves (MOVs) with reference stroke times greater than 10 seconds shall exhibit no more than a ±15% change in stroke time when compared to the reference time. MOVs with reference stroke times less than or equal to 10 seconds shall exhibit no more than a ±25% or ±1 second change in stroke time, whichever is greater, when compared to the reference time.
2. All other power-operated valves with reference stroke times greater than 10 seconds shall exhibit no more than a ±25% change in stroke time when compared to the reference time. All other power-operated valves with reference stroke times less than or equal to 10 seconds shall exhibit no more than a ±50% change in stroke time when compared to the reference time.
3. Valves that stroke in less than 2 seconds may be exempted from 1 and 2 above. In such cases the maximum limiting stroke time shall be 2.0 seconds.
4. The ASME limiting stroke time is based on the following:
    a. The Technical Specification value.
    b. ESF response time requirements.
    c. The reference stroke time times 2 for valves with reference stroke times less than or equal to 10 seconds.
    d. The reference stroke time times 1.5 for valves with reference stroke times greater than 10 seconds.
    e. The design time listed in the UFSAR.

The necessary valve disk movement shall be determined by exercising the valve while observing an appropriate indicator, such as indicating lights which signal the required change of disk position, or by observing other evidence, such as changes in system pressure, flow rate, level, or temperature, which reflect disk position. Control Room position indicating lights (or arrows for modulating valves) are used for valve stroke indication for all testing of power-operated valves with remote position indicators on the Control Board. In addition, valves with remote position indicators will be observed locally at least once every 2 years to verify that valve operation is accurately indicated in the direction required to fulfill its function. Where practicable, this local observation may be supplemented by other indications such as use of flow meters or other suitable instrumentation to verify disk position. However, these observations need not be concurrent. Where local observation is not possible other indications shall be used for verification of valve operation.

All valves with fail-safe actuators (e.g., solenoid operated valves, air operated valves or air operated control valves) shall be tested by observing the operation of the actuator upon loss of valve actuating power. Solenoid operated valves (SOVs) are tested from the Control Room by their remote operating (control) switch. Placing the control switch to the fail-safe position de-energizes the solenoid thus positioning the valve in the fail-safe position. Air operated valves (AOVs) are tested from the Control Room by their remote operating (control) switch. Placing the control switch to the fail-safe position

de-energizes the control power to the solenoid which vents air from the valve actuator thus positioning the valve in the fail-safe position. Air operated control valves may be tested in a similar fashion, or the valve actuating power (e.g., electrical or air supply) may be removed to position the valve in the fail-safe position.

Corrective action shall be taken if necessary, using the following:

1. If a valve fails to exhibit the required change of valve disk position or exceeds its specified ASME limiting value of full-stroke time, then the valve shall be declared inoperable immediately. An evaluation of the valve's condition with respect to system operability and technical specifications shall be made as follows:

   a. If the inoperable valve is specifically identified in the technical specifications, then the applicable technical specification action statements shall be followed.

   b. If the inoperable valve is in a system covered by a technical specification, an assessment of its condition shall be made to determine if it makes the system inoperable. If the condition of the valve renders the system inoperable, then the applicable system technical specification action statements shall be followed.

   c. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supercede the requirements of any technical specification.

2. Valves with measured stroke times which do not meet the acceptance criteria in OM-10, Paragraph 4.2.1.8 (i.e., % change when compared to the baseline time) shall be immediately retested or declared inoperable as follows:

   a. If the valve is retested and the second set of data meets the acceptance criteria of OM-10, Paragraph 4.2.1.8, the cause of the initial deviation shall be analyzed and the results documented in the test.

   b. If the valve is retested and the second set of data also does not meet the acceptance criteria of OM-10, Paragraph 4.2.1.8, the data shall be analyzed within 96 hours to verify that the new stroke time represents acceptable valve operation, or the valve shall be declared inoperable. Valve operability based on analysis shall have the results of the analysis documented in the test.

3. Valves declared inoperable may be repaired, replaced, or the data may be analyzed to determine the cause of the deviation and the valve shown to be operating acceptably. Valve operability based on analysis shall have the results of the analysis documented in the test.

4. When a valve or its control system has been replaced, repaired or has undergone maintenance that could affect the valve's performance, a new reference value shall be determined or the previous value reconfirmed by an inservice test run prior to the time it is returned to service or immediately if not removed from service, to demonstrate that the performance parameter which could be affected by the replacement, repair or maintenance is within acceptable limits. Deviations between the previous and new reference values shall be identified and analyzed. Verification that the new values represent acceptable operation shall be documented in the test. Examples of maintenance that could affect valve performance parameters are adjustment of stem packing, limit switches, or control system valves, and removal of the bonnet, stem assembly, actuator, obturator, or control system components.

In addition, Category A valves shall be leak rate tested at least once every two years normally, but not necessarily, at refueling outages. The Category A valves that are tested in accordance with Option B of 10CFR50, Appendix J, Type C, per relief, are leak rate tested at the frequency specified in Option B of 10CFR50, Appendix J. If the leak rate exceeds the allowable limit, the valves will be repaired or replaced. A retest demonstrating acceptable operation will be performed following any required corrective action before the valve is returned to service.

B. Category C valves are valves which are self-actuating in response to some system characteristic, such as pressure (relief valves) or flow direction (check valves) for fulfillment of their function. Category C valves are divided into two groups; safety or relief valves and check valves.

ASME Class 1, 2 and 3 safety and relief valves are tested in accordance with ASME/ANSI Operations and Maintenance (OM) Standard, Part 1, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices" (OM-1). All Main Steam Safety Valves and ASME Class 1 safety and relief valves are tested at least once every 5 years, with at least 20% of the valves in each "group" (i.e., same manufacturer, type, system application and service media per NUREG-1482, Section 4.3.9, "Clarifications in OM-1") included in the BVPS-2 IST Program tested within any 24 months. All ASME Class 2 and 3 safety and relief valves are tested at least once every 10 years, with at least 20% of the valves in each "group" included in the BVPS-2 IST Program tested with any 48 months. A test is defined as a set pressure test and a seat tightness test. If any safety or relief valves fail their set pressure test, additional valves shall be set pressure tested on the basis of 2 additional valves to be tested for each valve failure up to the total number of valves from the same group. If any of the additional valves fail, then all remaining valves in the same group shall be set pressure tested. Any safety or relief valve which exceeds its set pressure acceptance criteria shall be repaired or replaced, the cause of failure shall be determined and corrected, and the valve shall successfully pass a retest before it is returned to service. Per NUREG-1482, Section 4.3.6, "Safety/Relief Valve Setpoint Adjustments", the NRC has determined that a setpoint adjustment is an acceptable means of corrective action in lieu of repair or replacement. In addition, a seat tightness test shall be based on a quantitative or qualitative acceptance criteria specified by the owner for gross determination of the as-found seat tightness of a safety or relief valve.

Check valves shall be exercised or examined nominally every three months in a manner which verifies obturator (disk) travel to the closed, full-open or partially open position required to fulfill their function unless such operation is not practicable during plant operation. If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke during plant operation and full-stroke during cold shutdowns. If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns. If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, it may be limited to part-stroke during cold shutdowns, and full-stroke during refueling outages. If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages. In the case of frequent cold shutdowns, these check valves need not be exercised more often than once every three months. All check valve testing required to be performed during a refueling outage shall be completed prior to returning the plant to operation. For a check valve in a system declared inoperable or not required to be operable, the exercising test schedule need not be followed. Within 3

months prior to placing the system in an operable status, the valves shall be exercised and the schedule resumed.

Check valves that are normally open during plant operation and whose function is to prevent reversed flow shall be tested in a manner that proves that the disk travels to the seat on cessation or reversal of flow. Check valves that are normally closed during plant operation and whose function is to open shall be tested by proving that the disk opens to the position required to fulfill its function when flow through the valve is initiated, or when a mechanical opening force is applied to the disk. If the check valves cannot be tested mechanically or with flow, they will be disassembled and inspected per the requirements of Generic Letter No. 89-04. These check valves will normally, but not necessarily be inspected during refueling outages.

If a check valve fails to exhibit the required change of disk position by this testing, then the check valve shall be declared inoperable immediately. An evaluation of the check valve's condition with respect to system operability and technical specifications shall be made as follows:

1. If the inoperable check valve is specifically identified in the technical specifications, then the applicable technical specification action statements shall be followed.
2. If the inoperable check valve is in a system covered by a technical specification, an assessment of its condition shall be made to determine if it makes the system inoperable. If the condition of the check valve renders the system inoperable, then the applicable system technical specification action statements shall be followed.
3. Corrective action (i.e., MWR) shall be initiated immediately for the check valve's repair or replacement.
4. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supercede the requirements of any technical specification.

Before returning the check valve to service after corrective action, a retest showing acceptable performance shall be run.

C. Category D valves are valves which are actuated by an energy source capable of only one operation, such as rupture disks or explosively actuated valves. There are no ASME Class 1, 2, or 3 Category D valves in the Beaver Valley Power Station, Unit 2, IST Program.

All the inservice testing requirements for each different category of valve in the IST Program are summarized in Table 1 of OM-10. This table lists the paragraphs of OM-10 that apply to each different type of valve.

TABLE 1
INSERVICE TEST REQUIREMENTS FROM OM-10

Category (See Para. 1.4)	Valve Function	Leakage Test Procedure	Exercise Test Procedure	Special Test Procedure [Note (1)]	Position Indication Verification
A	Active	See para. 4.2.2	See para. 4.2.1	None	See para. 4.1
A	Passive	See para. 4.2.2	None	None	See para. 4.1
B	Active	None	See para. 4.2.1	None	See para. 4.1
B	Passive	None	None	None	See para. 4.1
C (Safety and Relief)	Active	None [Note (2)]	See para. 4.3.1	None	See para. 4.1
C (Check)	Active	None [Note (2)]	See para. 4.3.2	None	See para. 4.1
D	Active	None	None	See para. 4.4	None

NOTES:
(1) Note additional requirement for fail-safe valves, para. 4.2.1.8.
(2) When more than one distinguishing category, characteristic is applicable, all requirements of each of the individual categories are applicable, although duplication or repetition of common testing requirements is not necessary.

Passive valves are valves which maintain obturator position and are not required to change obturator position to accomplish a required function. As stated in the table, passive valves are not required to be exercised. Therefore, relief is not required from exercising any passive valve and no testing requirement is listed in the Valve Outline Section except where remote position verification is required.

Certain exemptions from the valve testing requirements of the ASME code defined by Paragraph 1.2 of OM-10 are listed below:

1. Valves used only for operating convenience (i.e., manual vent, drain, instrument and test valves);
2. Valves used only for system control (i.e., pressure, temperature or flow regulating valves);
3. Valves used only for system or component maintenance; and
4. External control and protection systems responsible for sensing plant conditions and providing signals for valve operation.

Manufacturer supplied skid-mounted valves (i.e., check valves, SOV's, TCV's, relief valves) which are integral sub-components of, and are required to support the operation of a parent pump or other component, are often times not designed to be tested in accordance with the ASME XI Code, regardless of their ASME Code class. Therefore, ASME Code class manufacturer supplied skid-mounted valves are not included in the BVPS Unit 2 IST Program because it has been recognized by the NRC in NUREG-1482, Section 3.4, that the test of the parent pump or other component itself challenges the operability of the sub-components. This ensures that the skid-mounted valves operate acceptably commensurate with their safety functions, provided satisfactory performance of the parent pump or other component is demonstrated by an applicable surveillance test or the valve is examined separately by a preventive maintenance activity.

Records of the results of inservice tests and corrective actions as required by Paragraph 6 of OM-10 are maintained in tabular form. Stroke times of valves will be reviewed for developing trends.

If a question on valve testability exists, the IST program should be the controlling document since each component is individually assessed for testability and inclusion in the IST Program. If a valve is specifically called out in the Tech. Specs. (i.e., specific valve mark number or uniquely specified by valve nomenclature) to be tested at one frequency and the IST Program endorses another frequency, then the more restrictive test frequency would be applicable.

The following four sections of this document are the "Valve Outlines", "Valve Cold Shutdown Justifications", "Valve Refueling Outage Justifications" and "Valve Relief Requests" sections.

The "Valve Outlines" section is a listing of all the valves in the IST Program, their system code class, category, size, type, NSA, drawing number and coordinates, testing requirements, specific cold shutdown justification, refueling outage justifications and/or relief request reference numbers, and test procedure numbers and comments.

1. The valve class will be 1, 2 or 3, corresponding to the safety classifications.
2. The category of the valve will be A, B, C or D in accordance with the guidelines in Paragraph 1.4 of OM-10. In addition, combinations of categories may be utilized. If the valve is not required to change obturator position to accomplish a required function, the fact that it is Passive (P) will also be indicated. For example, a containment isolation check valve that does not change position would be a category A/C/P valve.
3. From the valve mark number given, the valve actuator can be determined from the list of abbreviations below:

   AOV - Air Operated Valve
   FCV - Flow Control Valve
   HCV - Hand Control Valve
   HYV - Hydraulic Valve
   LCV - Level Control Valve
   MOD - Motor Operated Damper
   MOV - Motor Operated Valve
   PCV - Pressure Control Valve
   RV - Relief Valve
   SOV - Solenoid Operated Valve
   SV - Safety Valve
   DMP - Damper (Manual)

4. The normal system arrangement (NSA) will be listed using the abbreviations below:

   O - Open
   S - Shut
   A - Automatic
   T - Throttled
   LO - Locked Open
   LS - Locked Shut
   SS - Sealed Shut

5. The drawing numbers and coordinates will be the ones used in the Operating Manuals.

6. The test requirements will be listed using the abbreviations below:

   QS - Quarterly Stroke
   QST - Quarterly Stroke & Time
   LT - Leak Rate Test
   LTJ - Leak Rate Test per 10CFR50, Appendix J (Option B)
   SPT - Set Point Test
   LM - Leakage Monitoring
   POS - Position Verification
   NA - Not Applicable

7. The specific Valve Cold Shutdown Justification (VCSJ), Valve Refueling Outage Justification (VROJ) and/or Valve Relief Request (VRR) reference number(s) will be listed.

8. The specific test procedure number, required frequency, type of testing, and any comments will be listed using the abbreviations below:

   2OM - Operating Manual (Unit 2)
   2BVT - Beaver Valley Test (Unit 2)
   2OST - Operating Surveillance Test (Unit 2)
   CMP - Corrective Maintenance Procedure
   2 YR - Required every 2 years, but normally done at refueling
   5 YR - Required every 5 years, but normally done at refueling
   10 YR - Required every 10 years, but normally done at refueling
   CSD - Cold Shutdown Frequency
   R - Refueling Frequency
   SP - Special Frequency
   Q - Quarterly Frequency
   M - Monthly Frequency
   FS - Full Stroke
   PS - Partial Stroke
   FD - Forward Direction
   RD - Reverse Direction
   RPV - Remote Position Verification (Required every 2 years, but normally done at refueling)

The "Valve Cold Shutdown Justification" section contains the detailed technical description of conditions prohibiting the required testing of safety-related valves and an alternate test method to be performed during cold shutdowns. Beaver Valley Unit 2 reactor containment is maintained subatmospheric as required by technical specifications. The subatmospheric condition presents a hazardous working environment for station personnel and is considered inaccessible for surveillance testing. Surveillance testing that requires a reactor containment entry will be performed at cold shutdown and refueling. Per OM-10, Paragraphs 4.2.1.2(g) and 4.3.2.2(g), valve exercising during cold shutdown shall commence within 48 hours of achieving cold shutdown, and continue until all testing is complete or the plant is ready to return to power. Attempts will be made to complete testing prior to entering Mode 4, however, completion will not be a Mode 4 requirement. The testing will resume where left off when next entering Mode 5, but need not be completed more often than once every 92 days. For planned or extended cold shutdowns, where ample time is available to complete testing on all valves identified for the cold shutdown test frequency, exceptions to the 48 hour requirement can be taken, provided all valves required to be tested during cold shutdown are tested prior to plant startup.

The "Valve Refueling Outage Justifications" section contains the detailed technical description of conditions prohibiting the required testing of safety-related valves and an alternate test method to be performed during refueling outages.

The "Valve Relief Requests" section contains the detailed technical description of particular conditions and equipment installations prohibiting the testing of some of the characteristics of safety-related valves. An alternate test method and the frequency of revised testing is also included to meet the intent of 10CFR50.55a.

SECTION VIII: VALVE OUTLINES

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Reactor Coolant **SYSTEM NUMBER:** 6

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2RCS*68	2	A/C	2 ½	Check		6-2	E-2	QS	VROJ52	2BVT 1.47.3-FS,RD by observation of mechanical weight loaded swing arm (R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2RCS*72	2	A/C	3	Check		6-2	F-2	QS	VROJ53	2BVT 1.47.3-FS,RD by observation of mechanical observation of mechanical weight loaded swing arm (R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2RCS*RV100	2	A/C	¾	Relief		6-2	G-2	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2RCS*AOV101	2	A	¾	Globe	S	6-2	E-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2RCS*SOV200A	1	B	1	Globe	S	6-2	E-6	QST	VROJ1	2OST-6.9-Stroke & Time Open/Closed (R),(RPV)
2RCS*SOV200B	1	B	1	Globe	S	6-2	F-6	QST	VROJ1	2OST-6.9-Stroke & Time Open/Closed (R),(RPV)
2RCS*SOV201A	1	B	1	Globe	S	6-2	E-6	QST	VROJ1	2OST-6.9-Stroke & Time Open/Closed (R),(RPV)
2RCS*SOV201B	1	B	1	Globe	S	6-2	F-6	QST	VROJ1	2OST-6.9-Stroke & Time Open/Closed (R),(RPV)
2RCS*HCV250A	2	B	1	Globe	S	6-2	G-6	QST	VROJ1	2OST-6.9-Stroke & Time Open/Closed and Fail Closed (R),(RPV)
2RCS*HCV250B	2	B	1	Globe	S	6-2	G-6	QST	VROJ1	2OST-6.9-Stroke & Time Open/Closed and Fail Closed (R),(RPV)
2RCS*PCV455C	1	B	3	Globe	S(A)	6-1	F-1	QST	VCSJ3	2OST-6.8-Stroke & Time Open and Fail Closed (CSD),(RPV)
2RCS*PCV455D	1	B	3	Globe	S(A)	6-1	F-1	QST	VCSJ3	2OST-6.8-Stroke & Time Open and Fail Closed (CSD),(RPV)
2RCS*PCV456	1	B	3	Globe	S(A)	6-1	E-1	QST	VCSJ3	2OST-6.8-Stroke & Time Open and Fail Closed (CSD),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Reactor Coolant **SYSTEM NUMBER:** 6

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2RCS*AOV519	2	A	3	Globe	S	6-2	F-1	QST		2OST-47 3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47 5-Leak Test (SP)
2RCS*MOV535	1	B	1	Gate	O	6-1	F-2	QST		2OST-6.6-Stroke & Time Open/Closed (Q),(RPV)
2RCS*MOV536	1	B	1	Gate	O	6-1	E-2	QST		2OST-6.6-Stroke & Time Open/Closed (Q),(RPV)
2RCS*MOV537	1	B	1	Gate	O	6-1	F-2	QST		2OST-6 6-Stroke & Time Open/Closed (Q),(RPV)
2RCS*RV551A	1	C	6x6	Safety		6-1	D-3	SPT		2BVT 1.60.5-(5 YR)
2RCS*RV551B	1	C	6x6	Safety		6-1	D-3	SPT		2BVT 1 60.5-(5 YR)
2RCS*RV551C	1	C	6x6	Safety		6-1	D-4	SPT		2BVT 1.60.5-(5 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Chemical and Volume Control **SYSTEM NUMBER:** 7

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CHS*22	2	C	3	Check		7-1A	E-3	QS		2OST-7.4-PS,FD (Q)
								QS		2OST-7.5(6)-FS,RD (Q)
								QS	VROJ2	2OST-11.14B-FS,FD (R)
2CHS*23	2	C	3	Check		7-1A	C-3	QS		2OST-7.5-PS,FD (Q)
								QS		2OST-7.4(6)-FS,RD (Q)
								QS	VROJ2	2OST-11.14B-FS,FD (R)
2CHS*24	2	C	3	Check		7-1A	D-3	QS		2OST-7.6-PS,FD (Q)
								QS		2OST-7.4(5)-FS,RD (Q)
								QS	VROJ2	2OST-11.14B-FS,FD (R)
2CHS*31	2	A/C	3	Check		7-1A	C-1	QS	VROJ3	2BVT-1.47.11-FS,RD by observation of mechanical weight loaded swing arm (R)
								QS		2OST-7.4(5)(6)-FS,FD(Q)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*75	3	C	2	Check		7-2	B-3	QS		2OST-7.1-FS,FD (Q)
2CHS*76	3	C	2	Check		7-2	F-3	QS		2OST-7.2-FS,FD (Q)
2CHS*84	3	C	2	Check		7-2	E-7	QS	VCSJ4	2OST-7.13-FS,FD (CSD)
2CHS*FCV113A	3	B	2	Globe	S(A)	7-2	E-7	QST		2OST-47.3B-Stroke, Time & Fail Open (Q),(RPV)
2CHS*FCV114A	3	B	2	Globe	S(A)	7-2	E-8	QST		2OST-47.3B-Stroke, Time & Fail closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Chemical and Volume Control **SYSTEM NUMBER:** 7

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CHS*LCV115B	2	A	8	Gate	S(A)	7-1A	E-5	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*LCV115C	2	B	4	Gate	O(A)	7-1A	F-5	QST	VROJ4	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*LCV115D	2	A	8	Gate	S(A)	7-1A	C-5	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*LCV115E	2	B	4	Gate	O(A)	7-1A	F-5	QST	VROJ4	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*136	2	C	2	Check		7-2	F-8	QS	VCSJ4	2OST-7.13-FS,FD (CSD)
2CHS*141	2	C	2	Check		7-2	F-9	QS	VCSJ4	2OST-7.13-FS,FD (CSD)
2CHS*HCV142	2	A	2	Globe	S	7-1A	A-9	QST		2OST-47.3B-Stroke & Time Closed (Q), (RPV)
								QST	VCSJ1	2OST-1.10 - Fail Closed (CSD)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CHS*152	2	C	2	Check		7-1A	E-3	QS		2OST-7.4-FS,FD (Q)
2CHS*153	2	C	2	Check		7-1A	C-3	QS		2OST-7.5-FS,FD (Q)
2CHS*154	2	C	2	Check		7-1A	D-3	QS		2OST-7.6-FS,FD (Q)
2CHS*FCV160	2	A/P	2	Globe	S	7-1A	G-3	POS		2OST-47.3B-(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*RV160	2	C	¾x1	Relief		7-1A	G-2	SPT		2BVT 1.60.5-(10 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Chemical and Volume Control **SYSTEM NUMBER:** 7

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CHS*AOV200A	2	A	2	Globe	S	7-1A	A-6	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1 47.5-Leak Test (SP)
2CHS*AOV200B	2	A	2	Globe	O	7-1A	A-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1 47.5-Leak Test (SP)
2CHS*AOV200C	2	A	2	Globe	S	7-1A	A-8	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CHS*RV203	2	A/C	2x3	Relief		7-1A	A-8	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1 47.5-Leak Test (SP)
2CHS*AOV204	2	A	2	Globe	O	7-1A	A-10	QST	VROJ5	2OST-1 10-Stroke & Time Closed (CSD or R),(RPV)
								LTJ		2BVT 1.47 5-Leak Test (SP)
2CHS*SOV206	2	B	1	Globe	S	7-2	E-8	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-7.13-(RPV)
2CHS*RV260A	2	C	¼x1	Relief		7-3	B-4	SPT		2BVT 1.60.5-(10 YR)
2CHS*RV260B	2	C	¼x1	Relief		7-3	E-4	SPT		2BVT 1.60.5-(10 YR)
2CHS*RV260C	2	C	¼x1	Relief		7-3	G-4	SPT		2BVT 1.60.5-(10 YR)
2CHS*MOV2B9	2	A	3	Gate	O	7-1A	D-1	QST	VROJ6	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LT		2BVT 1 47 11-Leak Test (2 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Chemical and Volume Control — **SYSTEM NUMBER:** 7

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CHS*MOV308A	2	A	2	Gate	O	7-3	B-3	QST	VROJ7	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*MOV308B	2	A	2	Gate	O	7-3	D-3	QST	VROJ7	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*MOV308C	2	A	2	Gate	O	7-3	G-3	QST	VROJ7	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*MOV310	2	B	3	Gate	O	7-1A	B-2	QST	VROJ8	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*MOV350	2	B	2	Globe	S	7-2	F-8	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2CHS*MOV378	2	A	3	Gate	O	7-3	E-8	QST	VROJ9	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CHS*MOV381	2	A	3	Gate	O	7-3	F-8	QST	VROJ9	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CHS*RV382A	2	C	2x3	Relief		7-3	C-8	SPT		2BVT 1.60.5-(10 YR)
2CHS*RV382B	2	C	2x3	Relief		7-3	E-10	SPT		2BVT 1.60.5-(10 YR)
2CHS*LCV460A	1	B	2	Globe	O	7-1A	A-1	QST	VROJ10	2OST-1.10-Stroke, Time & Fail Closed (CSD or R),(RPV)
2CHS*LCV460B	1	B	2	Globe	O	7-1A	A-2	QST	VROJ10	2OST-1.10-Stroke, Time & Fail Closed (CSD or R),(RPV)
2CHS*472	2	A/C/P	2½	Check		7-1A	G-3	LT		2BVT 1.47.11-Leak Test (2 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Chemical and Volume Control **SYSTEM NUMBER:** 7

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CHS*473	2	A/C	2½	Check		7-3	E-8	QS	VROJ11	2OST-1.10-FS,FD,RD by Mechanical Exerciser (CSD or R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CHS*474	2	A/C	2½	Check		7-3	B-4	QS	VROJ12	2BVT-1.47.11-FS,RD by obsersavation of mechanical weight loaded swing arm (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*475	2	A/C	2½	Check		7-3	G-4	QS	VROJ12	2BVT-1.47.11-FS,RD by observation of mechanical weight loaded swing arm (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*476	2	A/C	2½	Check		7-3	D-4	QS	VROJ12	2BVT-1.47.11-FS,RD by observation of mechanical weight loaded swing arm (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2CHS*870	1	C	3	Check		7-1A	B-1	QS		2OST-7.4(5)(6)-FS,FD(Q)
2CHS*871	1	C	3	Check		7-1A	B-2	QS		2OST-7.4(5)(6)-FS,FD(Q)
2CHS*MOV8130A	2	B	8	Gate	LO	7-1A	D-5	QST	VROJ13	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*MOV8130B	2	B	8	Gate	LO	7-1A	D-5	QST	VROJ13	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*MOV8131A	2	B	8	Gate	LO	7-1A	D-5	QST	VROJ13	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*MOV8131B	2	B	8	Gate	LO	7-1A	C-5	QST	VROJ13	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*MOV8132A	2	B	4	Gate	LO	7-1A	D-2	QST	VROJ13	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*MOV8132B	2	B	4	Gate	LO	7-1A	D-2	QST	VROJ13	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*MOV8133A	2	B	4	Gate	LO	7-1A	C-2	QST	VROJ13	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Chemical and Volume Control **SYSTEM NUMBER:** 7

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CHS*MOV8133B	2	B	4	Gate	LO	7-1A	C-2	QST	VROJ13	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
2CHS*RV8144	2	C	¾x1	Relief		7-1A	C-1	SPT		2BVT 1.60 5-(10 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Reactor Plant Vents and Drains (Aerated Drains) **SYSTEM NUMBER:** 9

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2DAS*AOV100A	2	A	2	Globe	S	9-1	F-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2DAS*AOV100B	2	A	2	Globe	O	9-1	F-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2DAS*RV110	2	A/C	1½x2½	Relief		9-1	F-3	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Reactor Plant Vents and Drains (Hydrogenated Drains) **SYSTEM NUMBER:** 9

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2DGS*AOV108A	2	A	2	Globe	S	9-1	F-10	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2DGS*AOV108B	2	A	2	Globe	O	9-1	E-10	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2DGS*RV115	2	A/C	1½x2	Relief		9-1	E-9	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Reactor Plant Vents and Drains (Hydrogenated Gaseous Vents) **SYSTEM NUMBER:** 9

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2VRS*AOV109A1	2	A	1½	Globe	O	9-1	C-9	QST		2OST-47 3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1 47 5-Leak Test (SP)
2VRS*AOV109A2	2	A	1½	Globe	O	9-1	C-9	QST		2OST-47 3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1 47 5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Residual Heat Removal **SYSTEM NUMBER:** 10

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2RHS^3	2	C	10	Check		10-1	B-3	QS	VCSJ5	2OST-10.1-FS,FD (CSD)
								QS	VCSJ5	2OST-10.3-FS,RD (CSD)
2RHS^4	2	C	10	Check		10-1	E-3	QS	VCSJ5	2OST-10.2-FS,FD (CSD)
								QS	VCSJ5	2OST-10.4-FS,RD (CSD)
2RHS^15	2	A/P	6	Globe	LS	10-1	D-8	LTJ		2BVT 1.47.5-Leak Test (SP)
2RHS^RV100	2	A/C	¾x1	Relief		10-1	D-8	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2RHS^107	2	A/P	6	Globe	LS	10-1	D-7	LTJ		2BVT 1.47.5-Leak Test (SP)
2RHS*FCV605A	2	B	8	Butterfly	T	10-1	C-5	QST	VCSJ6	2OST-10.3-Stroke, Time & Fail Closed (CSD), (RPV)
2RHS*FCV605B	2	B	8	Butterfly	T	10-1	F-5	QST	VCSJ6	2OST-10.4-Stroke, Time & Fail Closed (CSD),(RPV)
2RHS*MOV701A	1	A	12	Gate	S	10-1	C-1	QST	VCSJ7	2OST-10.3-Stroke & Time Open/Closed (CSD),(RPV)
								LT		2OST-10.5-Leak Test (2 YR)(R per Tech Specs)
2RHS*MOV701B	1	A	12	Gate	S	10-1	E-1	QST	VCSJ7	2OST-10.4-Stroke & Time Open/Closed (CSD),(RPV)
								LT		2OST-10.5-Leak Test (2 YR)(R per Tech Specs)
2RHS*MOV702A	1	A	12	Gate	S	10-1	D-1	QST	VCSJ7	2OST-10.3-Stroke & Time Open/Closed (CSD),(RPV)
								LT		2OST-10.5-Leak Test (2 YR)(R per Tech Specs)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Residual Heat Removal **SYSTEM NUMBER:** 10

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2RHS*MOV702B	1	A	12	Gate	S	10-1	D-1	QST	VCSJ7	2OST-10.4-Stroke & Time Open/Closed (CSD),(RPV)
								LT		2OST-10.5-Leak Test (2 YR)(R per Tech Spec)
2RHS*MOV720A	1	A	10	Gate	S	10-1	C-8	QST	VCSJ7	2OST-10.3-Stroke & Time Open/Closed (CSD),(RPV)
								LM		Continuously Monitored by 2OM-54.3, Station Log L5-120
2RHS*MOV720B	1	A	10	Gate	S	10-1	F-8	QST	VCSJ7	2OST-10.4-Stroke & Time Open/Closed (CSD),(RPV)
								LM		Continuously Monitored by 2OM-54.3, Station Log L5-120
2RHS*RV721A	2	C	3x4	Relief		10-1	C-1	SPT		2BVT 1.60.5-(10 YR)
2RHS*RV721B	2	C	3x4	Relief		10-1	E-1	SPT		2BVT 1.60.5-(10 YR)
2RHS*HCV758A	2	B	10	Butterfly	T	10-1	C-5	QST	VCSJ8	2OST-10.3-Stroke, Time & Fail Open (CSD),(RPV)
2RHS*HCV758B	2	B	10	Butterfly	T	10-1	F-5	QST	VCSJ8	2OST-10.4-Stroke, Time & Fail Open (CSD),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*6	2	A/C	10	Check		11-1	E-4	QS		2OST-11.2-FS,RD (Q)
								QS	VROJ14	2OST-11.14A-FS,FD (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*7	2	A/C	10	Check		11-1	G-4	QS		2OST-11.1-FS,RD (Q)
								QS	VROJ14	2OST-11 14A-FS,FD (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*27	2	A/C	8	Check		11-1	F-1	QS	VROJ15	2OST-1.10-PS,FD (CSD) 2OST-11 14B-FS,FD (R)
								QS	VROJ15	2BVT 1.47.11-FS,RD by Leak Test (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*41	2	A/P	1	Globe	LS	11-2	C-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2SIS*42	2	A/C	2½	Check		11-2	D-2	QS	VROJ16	2BVT-1.47.3-FS,RD by observation of mechanical weight loaded swing arm (R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SIS*46	2	C	10	Check		11-1	G-5	QS	VROJ17	2OST-1.10-FS,FD by Mechanical Exerciser (R)
2SIS*47	2	C	10	Check		11-1	E-5	QS	VROJ17	2OST-1.10-FS,FD by Mechanical Exerciser (R)
2SIS*83	2	A/C	3	Check		11-1	A-4	QS	VROJ18	2OST-11.14B-FS,FD,RD (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*84	2	A/C	3	Check		11-1	B-4	QS	VROJ18	2OST-11.14B-FS,FD,RD (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*94	2	A/C	3	Check		11-1	D-6	QS	VROJ18	2OST-11.14B-FS,FD,RD (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*95	2	A/C	3	Check		11-1	C-6	QS	VROJ18	2OST-11.14B-FS,FD,RD (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*107	1	A/C	6	Check		11-1	G-9	QS	VROJ19	2OST-11.14A-FS,FD (R)
								LT		2OST-11.16-Leak Test (2 YR)(CSD or R per Tech Specs)
2SIS*108	1	A/C	6	Check		11-1	E-9	QS	VROJ19	2OST-11.14A-FS,FD (R)
								LT		2OST-11.16-Leak Test (2 YR)(CSD or R per Tech Specs)
2SIS*109	1	A/C	6	Check		11-1	F-9	QS	VROJ19	2OST-11.14A-FS,FD (R)
								LT		2OST-11.16-Leak Test (2 YR)(CSD or R per Tech Specs)
2SIS*122	1	C	2	Check		11-1	A-7	QS	VROJ20	2OST-11.14B-FS,FD (R)
2SIS*123	1	C	2	Check		11-1	A-7	QS	VROJ20	2OST-11.14B-FS,FD (R)
2SIS*124	1	C	2	Check		11-1	A-7	QS	VROJ20	2OST-11.14B-FS,FD (R)
2SIS*125	1	C	2	Check		11-1	B-7	QS	VROJ20	2OST-11.14B-FS,FD (R)
2SIS*126	1	C	2	Check		11-1	B-7	QS	VROJ20	2OST-11.14B-FS,FD (R)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*127	1	C	2	Check		11-1	B-7	QS	VROJ20	2OST-11.14B-FS,FD (R)
2SIS*128	1	A/C	6	Check		11-1	B-9	QS	VROJ21	2OST-11.14A-FS,FD (R)
								LT		2OST-11 16-Leak Test (2 YR)(R per Tech Specs)
2SIS*129	1	A/C	6	Check		11-1	B-9	QS	VROJ21	2OST-11.14A-FS,FD (R)
								LT		2OST-11.16-Leak Test (2 YR)(R per Tech Specs)
2SIS*130	2	A/C	10	Check		11-1	F-9	QS	VROJ22	2OST-11.14A-FS,FD,RD (R)
								LT		2BVT 1.47.11-Leak Test (2 YR)(R per Tech Specs)
2SIS*RV130	2	A/C	¾x1	Relief		11-2	D-2	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SIS*132	2	A/C	10	Check		11-1	G-9	QS	VROJ23	2OST-11 14A-FS,FD,RD (R)
								LT		2OST-11 16-Leak Test (2 YR)(CSD or R per Tech Specs)
2SIS*133	2	A/C	10	Check		11-1	E-9	QS	VROJ23	2OST-11.14A-FS,FD,RD (R)
								LT		2OST-11 16-Leak Test (2 YR)(CSD or R per Tech Specs)
2SIS*134	1	C	2	Check		11-1	C-9	QS	VROJ24	2OST-11.14B-FS,FD (R)
2SIS*135	1	C	2	Check		11-1	D-9	QS	VROJ24	2OST-11.14B-FS,FD (R)
2SIS*136	1	C	2	Check		11-1	D-9	QS	VROJ24	2OST-11 14B-FS,FD (R)
2SIS*137	1	C	2	Check		11-1	C-9	QS	VROJ24	2OST-11.14B-FS,FD (R)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*138	1	C	2	Check		11-1	C-9	QS	VROJ24	2OST-11.14B-FS,FD (R)
2SIS*139	1	C	2	Check		11-1	C-9	QS	VROJ24	2OST-11.14B-FS,FD (R)
2SIS*141	1	A/C	12	Check		6-1	E-6	QS	VROJ50	2OST-10.1-PS,FD(CSD) 2BVT 1.11.3-FS,FD (R)
								LT		2OST-11.4-Leak Test (2 YR)(CSD or R per Tech Specs)
2SIS*142	1	A/C	12	Check		11-2	F-9	QS	VROJ50	2BVT 1.11.3-FS,FD (R)
								LT		2OST-11.5-Leak Test (2 YR)(R per Tech Specs)
2SIS*145	1	A/C	12	Check		6-1	D-6	QS	VROJ50	2OST-10.2-PS,FD(CSD) 2BVT 1.11.3-FS,FD (R)
								LT		2OST-11.4-Leak Test (2 YR)(CSD or R per Tech Specs)
2SIS*147	1	A/C	12	Check		11-2	F-7	QS	VROJ50	2BVT 1.11.3-FS,FD (R)
								LT		2OST-11.5-Leak Test (2 YR)(R per Tech Specs)
2SIS*148	1	A/C	12	Check		11-2	F-4	QS	VROJ50	2BVT 1.11.3-FS,FD (R)
								LT		2OST-11.5-Leak Test (2 YR)(R per Tech Specs)
2SIS*151	1	A/C	12	Check		6-1	D-5	QS	VROJ50	2BVT 1.11.3-FS,FD (R)
								LT		2OST-11.4-Leak Test (2 YR)(R per Tech Specs)
2SIS*RV175	2	A/C	¾x1	Relief		11-2	F-1	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*545	1	A/C	6	Check		11-1	A-9	QS	VROJ25	2OST-11.14A-FS,FD (R)
								LM		Monitored approximately monthly during RCP operation, and additionally monitored during planned RCP shutdowns per 2OM-51.4.C, and during RCP startups per 2OM-50.4.A when maximum d/p conditions exist.
2SIS*546	1	A/C	6	Check		11-1	A-9	QS	VROJ25	2OST-11.14A-FS,FD (R)
								LM		Monitored approximately monthly during RCP operation, and additionally monitored during planned RCP shutdowns per 2OM-51.4.C, and during RCP startups per 2OM-50.4.A when maximum d/p conditions exist.
2SIS*547	1	A/C	6	Check		11-1	A-9	QS	VROJ26	2OST-11.14B-FS,FD (R)
								LM		Monitored approximately monthly during RCP operation, and additionally monitored during planned RCP shutdowns per 2OM-51.4.C, and during RCP startups per 2OM-50.4.A when maximum d/p conditions exist.
2SIS*548	1	A/C	6	Check		11-1	A-10	QS	VROJ27	2OST-11.14A-FS,FD (R)
								LM		Monitored approximately monthly during RCP operation, and additionally monitored during planned RCP shutdowns per 2OM-51.4.C, and during RCP startups per 2OM-50.4.A when maximum d/p conditions exist.
2SIS*550	1	A/C	6	Check		11-1	A-10	QS	VROJ27	2OST-11.14A-FS,FD (R)
								LM		Monitored approximately monthly during RCP operation, and additionally monitored during planned RCP shutdowns per 2OM-51.4.C, and during RCP startups per 2OM-50.4.A when maximum d/p conditions exist.
2SIS*552	1	A/C	6	Check		11-1	A-10	QS	VROJ27	2OST-11 14A-FS,FD (R)
								LM		Monitored approximately monthly during RCP operation, and additionally monitored during planned RCP shutdowns per 2OM-51 4.C, and during RCP startups per 2OM-50 4 A when maximum d/p conditions exist.

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*MOV836	2	A	3	Gate	S	11-1	D-5	QST	VROJ28	2OST-1.10-Stroke & Time Open/Closed (CSD or R),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*MOV840	2	A	1	Globe	S	11-1	D-6	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		BVT 1.47.11-Leak Test (2 YR)
2SIS*MOV841	2	B	3	Gate	O	11-1	B-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SIS*MOV842	2	A	2	Globe	S	11-2	F-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SIS*RV858A	2	C	1x2	Relief		11-2	D-4	SPT		2BVT 1.60.5-(10 YR)
2SIS*RV858B	2	C	1x2	Relief		11-2	D-7	SPT		2BVT 1.60.5-(10 YR)
2SIS*RV858C	2	C	1x2	Relief		11-2	D-9	SPT		2BVT 1.60.5-(10 YR)
2SIS*MOV863A	2	B	8	Gate	S	11-1	E-7	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2SIS*MOV863B	2	B	8	Gate	S	11-1	F-6	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2SIS*MOV865A	2	B	12	Gate	O	11-2	F-4	QST	VCSJ9	2OM-51.4.C & 2OST-1.10-Stroke & Time Closed (CSD) 2BVT 1.11.3-(RPV)
2SIS*MOV865B	2	B	12	Gate	O	11-2	F-7	QST	VCSJ9	2OM-51.4.C & 2OST-1.10-Stroke & Time Closed (CSD) 2BVT 1.11.3-(RPV)
2SIS*MOV865C	2	B	12	Gate	O	11-2	F-9	QST	VCSJ9	2OM-51.4.C & 2OST-1.10-Stroke & Time Closed (CSD) 2BVT 1.11.3-(RPV)
2SIS*MOV867A	2	B	3	Gate	S	11-1	B-2	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2SIS*MOV867B	2	B	3	Gate	S	11-1	C-2	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*MOV867C	2	A	3	Gate	S	11-1	C-5	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*MOV867D	2	A	3	Gate	S	11-1	C-4	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*HCV868A	2	B	1	Globe	S	11-1	D-5	QST	VCSJ10	2OST-1.10-Stroke & Time Open/Closed and Fail Closed (CSD) (RPV)
2SIS*HCV868B	2	B	1	Globe	S	11-1	B-3	QST	VCSJ10	2OST-1.10-Stroke & Time Open/Closed and Fail Closed (CSD) (RPV)
2SIS*MOV869A	2	A	3	Gate	S	11-1	A-3	QST	VROJ29	2OST-1.10-Stroke & Time Open/Closed (CSD or R),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*MOV869B	2	A	3	Gate	S	11-1	B-3	QST	VROJ29	2OST-1.10-Stroke & Time Open/Closed (CSD or R),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*AOV889	2	A	3/4	Globe	S	11-2	F-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SIS*894	2	C	4	Check		11-1	E-3	QS		2OST-11.1-FS,FD (Q)
								QS		2OST-11.2-FS,RD (Q)
2SIS*895	2	C	4	Check		11-1	G-4	QS		2OST-11.2-FS,FD (Q)
								QS		2OST-11.1-FS,RD (Q)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*MOV8809A	2	A	14	Gate	O	11-1	E-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*MOV8809B	2	A	14	Gate	O	11-1	G-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*MOV8811A	2	B	10	Gate	S	11-1	E-5	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2SIS*MOV8811B	2	B	10	Gate	S	11-1	F-5	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2SIS*RV8864A	2	C	¾x1	Relief		11-1	F-7	SPT		2BVT 1.60.5-(10 YR)
2SIS*RV8864B	2	C	¾x1	Relief		11-1	G-6	SPT		2BVT 1.60.5-(10 YR)
2SIS*RV8865	2	C	¾x1	Relief		11-1	F-7	SPT		2BVT 1.60.5-(10 YR)
2SIS*MOV8887A	2	B	10	Gate	O	11-1	F-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2SIS*MOV8887B	2	B	10	Gate	O	11-1	F-8	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2SIS*MOV8888A	2	A	10	Gate	O	11-1	E-8	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*MOV8888B	2	A	10	Gate	O	11-1	G-8	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)
2SIS*MOV8889	2	A	10	Gate	S	11-1	F-8	QST	VROJ30	2OST-1.10-Stroke & Time Open/Closed (CSD or R),(RPV)
								LT		2BVT 1.47.11-Leak Test (2 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SIS*MOV8890A	2	A	4	Gate	S	11-1	E-4	QST		2OST-47 3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		2BVT 1 47.11-Leak Test (2 YR)
2SIS*MOV8890B	2	A	4	Gate	S	11-1	F-4	QST		2OST-47 3B-Stroke & Time Open/Closed (Q),(RPV)
								LT		2BVT 1 47 11-Leak Test (2 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Safety Injection (Gaseous Nitrogen) **SYSTEM NUMBER:** 11

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2GNS*AOV101-1	2	A	1	Globe	O	11-2	B-3	QST		2OST-47.3B-Stroke & Time Closed (Q) 2OST-1.10-(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2GNS*AOV101-2	2	A	1	Globe	O	11-2	C-3	QST		2OST-47.3B-Stroke & Time Closed (Q) 2OST-1.10-(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2GNS*SOV853A	2	B	1	Globe	S	11-2	C-4	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-1.10-(RPV)
2GNS*SOV853B	2	B	1	Globe	S	11-2	C-6	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-1.10-(RPV)
2GNS*SOV853C	2	B	1	Globe	S	11-2	C-9	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-1.10-(RPV)
2GNS*SOV853D	2	B	1	Globe	S	11-2	C-4	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-1.10-(RPV)
2GNS*SOV853E	2	B	1	Globe	S	11-2	D-6	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-1.10-(RPV)
2GNS*SOV853F	2	B	1	Globe	S	11-2	D-9	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-1.10-(RPV)
2GNS*SOV854A	2	B	1	Globe	S	11-2	C-2	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-1.10-(RPV)
2GNS*SOV854B	2	B	1	Globe	S	11-2	C-2	QST		2OST-47.3B-Stroke & Time Open (Q) 2OST-1.10-(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment Vacuum **SYSTEM NUMBER:** 12

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CVS^93	2	A/C	1	Check		12-1	E-2	QS		2OM-54 3-FS,FD by Station Log L5-133 in accordance with OM-10, Paragraph 4.2.1.5 (Q) (Also see VROJ31)
								QS	VROJ31	2BVT 1.47.5-FS,RD by Leak Test (R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CVS*SOV102	2	A	1	Globe	O	12-1	E-3	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2CVS*151	2	A/P	8	Butterfly	LS	12-1	A-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2CVS^151-1	2	A/P	8	Butterfly	LS	12-1	A-3	LTJ		2BVT 1.47.5-Leak Test (SP)
2CVS*SOV151A	2	A	2	Globe	O	12-1	B-4	QST		2OST-47.3B-Stroke & Time Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2CVS*SOV151B	2	A	2	Globe	O	12-1	D-4	QST		2OST-47.3B-Stroke & Time Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2CVS*SOV152A	2	A	2	Globe	O	12-1	B-4	QST		2OST-47.3B-Stroke & Time Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2CVS*SOV152B	2	A	2	Globe	O	12-1	D-4	QST		2OST-47.3B-Stroke & Time Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2CVS*SOV153A	2	A	1	Globe	O	12-1	F-3	QST		2OST-47.3B-Stroke & Time Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment Vacuum **SYSTEM NUMBER:** 12

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CVS*SOV153B	2	A	1	Globe	O	12-1	F-2	QST		2OST-47 3B-Stroke & Time Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Leakage Monitoring **SYSTEM NUMBER:** 12

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2LMS*51	2	A/P	½	Globe/Sealed	SS	12-2	E-6	LTJ		2BVT 1.47.5-Leak Test (SP)
2LMS*52	2	A/P	½	Globe/Sealed	SS	12-2	E-6	LTJ		2BVT 1.47.5-Leak Test (SP)
2LMS*SOV950	2	B	¾	Globe	O	12-1	F-9	QST		2OST-47.3B-Stroke & Time Open/Closed (Q) 2OST-47.105(RPV)
2LMS*SOV951	2	B	¾	Globe	O	12-1	E-9	QST		2OST-47.3B-Stroke & Time Open/Closed (Q) 2OST-47.105(RPV)
2LMS*SOV952	2	B	¾	Globe	O	12-1	C-9	QST		2OST-47.3B-Stroke & Time Open/Closed (Q) 2OST-47.105(RPV)
2LMS*SOV953	2	B	¾	Globe	O	12-1	B-9	QST		2OST-47.3B-Stroke & Time Open/Closed (Q) 2OST-47.105(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment Depressurization (Quench Spray) **SYSTEM NUMBER:** 13

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2QSS*3	2	A/C	10	Check		13-2	D-10	QS	VROJ32	2OST-1.10-FS,FD,RD by Mechanical Exerciser (R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2QSS*4	2	A/C	10	Check		13-2	C-9	QS	VROJ32	2OST-1.10-FS,FD,RD by Mechanical Exerciser (R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2QSS*MOV100A	2	B	12	Gate	O	13-2	A-8	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2QSS*MOV100B	2	B	12	Gate	O	13-2	G-8	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2QSS*SOV100A	2	A	2	Globe	S	13-2	D-7	QST	VCSJ12	2OST-1.10-Strike & Time Open/Closed (CSD)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2QSS*SOV100B	2	A	2	Globe	S	13-2	E-7	QST	VCSJ12	2OST-1.10-Stroke & Time Open/Closed (CSD)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2QSS*MOV101A	2	A	10	Gate	O	13-2	C-9	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2QSS*MOV101B	2	A	10	Gate	O	13-2	D-9	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2QSS*RV101A	2	A/C	¾x1	Relief		13-2	C-9	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment Depressurization (Quench Spray) **SYSTEM NUMBER:** 13

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2QSS*RV101B	2	A/C	¾x1	Relief		13-2	E-9	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2QSS*SOV101A	2	B	2	Globe	O	13-2	D-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q) 2OST-13.10A-(RPV-Open) 2BVT 1.47.5-(RPV-Closed)
2QSS*SOV101B	2	B	2	Globe	O	13-2	E-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q) 2OST-13.10B-(RPV-Open) 2BVT 1.47.5-(RPV-Closed)
2QSS*MOV102A	2	B	6	Gate	S	13-2	C-5	QST	VROJ33	2OST-1.10-Stroke & Time Open (R),(RPV)
2QSS*MOV102B	2	B	6	Gate	S	13-2	E-5	QST	VROJ33	2OST-1.10-Stroke & Time Open (R),(RPV)
2QSS*RV102A	2	C	1½x2	Relief		13-2	C-6	SPT		2BVT 1.60.5-(10 YR)
2QSS*RV102B	2	C	1½x2	Relief		13-2	E-6	SPT		2BVT 1.60.5-(10 YR)
2QSS*SOV102A	2	B	2	Globe	O	13-2	D-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q) 2OST-13.10A-(RPV-Open) 2BVT 1.47.5-(RPV-Closed)
2QSS*SOV102B	2	B	2	Globe	O	13-2	E-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q) 2OST-13.10B-(RPV-Open) 2BVT 1.47.5-(RPV-Closed)
2QSS*AOV120A	2	B	6	Globe	O	13-2	E-3	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2QSS*AOV120B	2	B	6	Globe	O	13-2	D-3	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2QSS*227	2	C	2	Check		13-2	C-6	QS		2OST-13.10A-FS,FD (Q)
								QS		2OST-13.10B-FS,RD (Q)
2QSS*228	2	C	2	Check		13-2	E-6	QS		2OST-13.10B-FS,FD (Q)
								QS		2OST-13.10A-FS,RD (Q)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment Depressurization (Quench Spray) **SYSTEM NUMBER:** 13

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2QSS*267	2	A/C	2½	Check		13-2	C-10	QS	VROJ34	2OST-1.10-FS,FD,RD by Mechanical Exerciser (R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2QSS*303	2	C	2	Check		13-2	A-8	QS		2OST-13 10A-FS,FD (Q)
								QS	VCSJ13	2OST-1.10-FS,RD (CSD)
2QSS*304	2	C	2	Check		13-2	F-8	QS		2OST-13.10B-FS,FD (Q)
								QS	VCSJ13	2OST-1 10-FS,RD (CSD)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment Depressurization (Recirculation Spray) **SYSTEM NUMBER:** 13

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2RSS*3	2	A/P	4	Gate	LS	13-1	B-3	LT		2BVT 1.13.6-Leak Test (2 YR)
2RSS*4	2	A/P	4	Gate	LS	13-1	C-8	LT		2BVT 1.13.6-Leak Test (2 YR)
2RSS*5	2	A/P	4	Gate	LS	13-1	E-1	LT		2BVT 1.13.6-Leak Test (2 YR)
2RSS*6	2	A/P	4	Gate	LS	13-1	E-10	LT		2BVT 1.13.6-Leak Test (2 YR)
2RSS*9	2	A/P	1½	Gate	S	13-1	F-2	LT		2BVT 1.13.6-Leak Test (2 YR)
2RSS*10	2	A/P	1½	Gate	S	13-1	E-9	LT		2BVT 1.13.6-Leak Test (2 YR)
2RSS*11	2	A/P	1½	Gate	S	13-1	E-4	LT		2BVT 1.13.6-Leak Test (2 YR)
2RSS*12	2	A/P	1½	Gate	S	13-1	E-7	LT		2BVT 1.13.6-Leak Test (2 YR)
2RSS*27	2	A/P	4	Gate	LS	13-1	C-2	LT		2BVT 1.13.5-Leak Test (2 YR)
2RSS*28	2	A/P	4	Gate	LS	13-1	C-9	LT		2BVT 1.13.5-Leak Test (2 YR)
2RSS*29	2	C	12	Check		13-1	B-2	QS	VCSJ14	2OST-1.10-FS,FD,RD by Mechanical Exerciser (CSD)
2RSS*30	2	C	12	Check		13-1	B-9	QS	VCSJ14	2OST-1.10-FS,FD,RD by Mechanical Exerciser (CSD)
2RSS*31	2	C	12	Check		13-1	B-4	QS	VCSJ14	2OST-1.10-FS,FD,RD by Mechanical Exerciser (CSD)
2RSS*32	2	C	12	Check		13-1	B-7	QS	VCSJ14	2OST-1.10-FS,FD,RD by Mechanical Exerciser (CSD)
2RSS*RV101C	2	C	¼x1	Relief		13-1	C-4	SPT		2BVT 1.60.5-(10 YR)
2RSS*RV101D	2	C	¼x1	Relief		13-1	C-7	SPT		2BVT 1.60.5-(10 YR)
2RSS*MOV154C	2	B	3	Gate	S	13-1	C-4	QST	VROJ55	2BVT 1.13.5-Stroke & Time Open/Closed (R)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment Depressurization (Recirculation Spray) **SYSTEM NUMBER:** 13

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2RSS*MOV154D	2	B	3	Gate	S	13-1	C-7	QST	VROJ55	2BVT 1.13.5-Stroke & Time Open/Closed (R)
2RSS*MOV155A	2	B	12	Butterfly	O	13-1	G-4	QST		2OST.47.3B-Stroke & Time Open/Closed (Q),(RPV)
2RSS*MOV155B	2	B	12	Butterfly	O	13-1	G-7	QST		2OST.47.3B-Stroke & Time Open/Closed (Q),(RPV)
2RSS*MOV155C	2	B	12	Butterfly	O	13-1	F-5	QST		2OST.47.3B-Stroke & Time Open/Closed (Q),(RPV)
2RSS*MOV155D	2	B	12	Butterfly	O	13-1	F-6	QST		2OST.47.3B-Stroke & Time Open/Closed (Q),(RPV)
2RSS*MOV156A	2	B	12	Gate	O	13-1	B-2	QST		2OST.47.3B-Stroke & Time Open/Closed (Q),(RPV)
2RSS*MOV156B	2	B	12	Gate	O	13-1	B-9	QST		2OST.47.3B-Stroke & Time Open/Closed (Q),(RPV)
2RSS*MOV156C	2	B	12	Gate	O	13-1	B-4	QST		2OST.47.3B-Stroke & Time Open/Closed (Q),(RPV)
2RSS*MOV156D	2	B	12	Gate	O	13-1	B-7	QST		2OST.47.3B-Stroke & Time Open/Closed (Q),(RPV)
2RSS*RV156A	2	C	¾x1	Relief		13-1	B-2	SPT		2BVT 1.60.5-(10 YR)
2RSS*RV156B	2	C	¾x1	Relief		13-1	B-9	SPT		2BVT 1.60.5-(10 YR)
2RSS*RV156C	2	C	¾x1	Relief		13-1	B-4	SPT		2BVT 1.60.5-(10 YR)
2RSS*RV156D	2	C	¾x1	Relief		13-1	B-7	SPT		2BVT 1.60.5-(10 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Reactor Plant Sample **SYSTEM NUMBER:** 14A

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SSR*AOV100A1	2	A	¾	Globe	O	14A-1	C-9	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*AOV100A2	2	A	¾	Globe	O	14A-1	D-9	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*AOV102A1	2	A	¾	Globe	S	14A-2	C-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*AOV102A2	2	A	¾	Globe	S	14A-2	D-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*AOV109A1	2	A	¾	Globe	O	14A-1	C-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*AOV109A2	2	A	¾	Globe	O	14A-1	D-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*AOV112A1	2	A	¾	Globe	O	14A-1	C-8	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*AOV112A2	2	A	¾	Globe	O	14A-1	D-8	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*AOV117A	2	B	¾	Globe	O	14A-1	B-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Reactor Plant Sample **SYSTEM NUMBER:** 14A

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SSR*AOV117B	2	B	¾	Globe	O	14A-1	B-3	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SSR*AOV117C	2	B	¾	Globe	O	14A-1	B-5	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SSR*RV117	2	A/C	¾x1	Relief		14A-1	D-6	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*RV118	2	A/C	¾x1	Relief		14A-2	C-1	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*RV119	2	A/C	¾x1	Relief		14A-1	D-9	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*RV120	2	A/C	¾x1	Relief		14A-2	C-2	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*RV121	2	A/C	¾x1	Relief		14A-1	D-8	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*RV122	2	A/C	¾x1	Relief		14A-2	C-2	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SSR*SOV128A1	2	A	¾	Globe	S	14A-2	B-3	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Reactor Plant Sample — **SYSTEM NUMBER:** 14A

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SSR*SOV128A2	2	A	¾	Globe	S	14A-2	D-2	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2SSR*SOV129A1	2	A	¾	Globe	S	14A-2	B-4	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2SSR*SOV129A2	2	A	¾	Globe	S	14A-2	D-2	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2SSR*SOV130A1	2	A	¾	Globe	O	14A-2	B-10	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2SSR*SOV130A2	2	A	¾	Globe	O	14A-2	C-10	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Post-Accident Sample **SYSTEM NUMBER:** 14C

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2PAS*SOV105A1	2	A	⅜	Globe	S	14C-2	A-2	QST		2OST-47 3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2PAS*SOV105A2	2	A	⅜	Globe	S	14C-2	A-3	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Primary Component Cooling Water — **SYSTEM NUMBER:** 15

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CCP*4	3	C	20	Check		15-1	B-5	QS		2OST-15.1-PS,FD & FS,RD (Q)
								QS	VROJ35	2OST-15.1-FS,FD (CSD or R)
2CCP*5	3	C	20	Check		15-1	F-5	QS		2OST-15.2-PS,FD & FS,RD (Q)
								QS	VROJ35	2OST-15.2-FS,FD (CSD or R)
2CCP*6	3	C	20	Check		15-1	D-5	QS		2OST-15.3-PS,FD & FS,RD (Q)
								QS	VROJ35	2OST-15.3-FS,FD (CSD or R)
2CCP*27A	3	B	20	Butterfly	O	15-1	D-6	QS	VCSJ15	2OST-1.10-Stroke Only Closed (CSD)
2CCP*27B	3	B	20	Butterfly	O	15-1	D-6	QS	VCSJ15	2OST-1.10-Stroke Only Closed (CSD)
2CCP*RV102	2	A/C	¾x1	Relief		15-2	D-4	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*RV103	2	A/C	¾x1	Relief		15-2	E-5	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*RV104	2	A/C	¾x1	Relief		15-2	D-4	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*RV105	2	A/C	¾x1	Relief		15-2	E-4	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Primary Component Cooling Water **SYSTEM NUMBER:** 15

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CCP*AOV107A	3	A	2	Globe	O	15-3	C-5	QST	VROJ36	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LT		2BVT 1.60.6-Leak Test (2 YR)
2CCP*AOV107B	3	A	2	Globe	O	15-3	F-5	QST	VROJ36	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LT		2BVT 1.60.6-Leak Test (2 YR)
2CCP*AOV107C	3	A	2	Globe	O	15-3	F-10	QST	VROJ36	2OST-1.10-Stroke & Time Closed (CSD or R),(RPV)
								LT		2BVT 1.60.6-Leak Test (2 YR)
2CCP*RV109	3	C	¼x1	Relief		15-5	D-5	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV110	3	C	¼x1	Relief		15-5	D-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV111A	3	C	¼x1	Relief		15-5	B-1	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV111B	3	C	¼x1	Relief		15-5	B-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*MOV112A	3	B	18	Butterfly	S	15-2	D-9	QST	VCSJ2	2OST-15.1(3)-Stroke & Time Open (Q), 2OST-10.3-Stroke & Time Open (CSD),(RPV)
2CCP*MOV112B	3	B	18	Butterfly	S	15-2	F-9	QST	VCSJ2	2OST-15.2(3)-Stroke & Time Open (Q), 2OST-10.4-Stroke & Time Open (CSD),(RPV)
2CCP*RV113A	3	C	¼x1	Relief		15-4	C-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV113B	3	C	¼x1	Relief		15-4	C-7	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV113C	3	C	¼x1	Relief		15-4	B-9	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV115A	3	C	¼x1	Relief		15-2	D-8	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV115B	3	C	¼x1	Relief		15-2	F-6	SPT		2BVT 1.60.5-(10 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Primary Component Cooling Water **SYSTEM NUMBER:** 15

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CCP*RV115C	3	C	¾x1	Relief		15-2	G-9	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV116A	3	C	¾x1	Relief		15-3	C-2	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV116B	3	C	¾x1	Relief		15-3	F-1	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV116C	3	C	¾x1	Relief		15-3	F-6	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV117	3	C	¾x1	Relief		15-3	B-8	SPT		2BVT 1.60.5-(10 YR)
2CCP*MOV118	3	B	2	Ball	O	15-2	C-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*RV118	3	C	¾x1	Relief		15-2	D-6	SPT		2BVT 1.60.5-(10 YR)
2CCP*MOV119	3	B	2	Ball	O	15-2	C-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*RV119A	3	C	¾x1	Relief		15-2	B-10	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV119B	3	C	¾x1	Relief		15-2	E-10	SPT		2BVT 1.60.5-(10 YR)
2CCP*MOV120	3	B	2	Ball	O	15-2	A-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*RV120A	3	C	¾x1	Relief		15-2	C-2	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV136A	3	C	¾x1	Relief		15-2	B-9	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV136B	3	C	¾x1	Relief		15-2	E-9	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139B	3	C	¾x1	Relief		15-2	G-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139D	3	C	¾x1	Relief		15-2	F-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139E	3	C	¾x1	Relief		15-2	F-3	SPT		2BVT 1.60.5-(10 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Primary Component Cooling Water **SYSTEM NUMBER:** 15

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CCP*RV139F	3	C	¼x1	Relief		15-2	E-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139G	3	C	¼x1	Relief		15-2	A-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139H	3	C	¼x1	Relief		15-2	A-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139I	3	C	¼x1	Relief		15-2	B-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139J	3	C	¼x1	Relief		15-2	B-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139K	3	C	¼x1	Relief		15-2	C-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV139L	3	C	¼x1	Relief		15-2	C-3	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV140	3	C	¼x1	Relief		15-2	E-7	SPT		2BVT 1.60.5-(10 YR)
2CCP*RV141	3	C	¼x1	Relief		15-2	B-7	SPT		2BVT 1.60.5-(10 YR)
2CCP*MOV150-1	2	A	18	Butterfly	O	15-2	D-3	QST	VROJ37	2OST-1.10-Stroke & Time Open/Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*MOV150-2	2	A	18	Butterfly	O	15-2	D-4	QST	VROJ37	2OST-1.10-Stroke & Time Open/Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*MOV151-1	2	A	18	Butterfly	O	15-2	E-3	QST	VROJ37	2OST-1.10-Stroke & Time Open/Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*MOV151-2	2	A	18	Butterfly	O	15-2	E-5	QST	VROJ37	2OST-1.10-Stroke & Time Open/Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Primary Component Cooling Water **SYSTEM NUMBER:** 15

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CCP*MOV156-1	2	A	18	Butterfly	O	15-2	D-3	QST	VROJ37	2OST-1.10-Stroke & Time Open/Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*MOV156-2	2	A	18	Butterfly	O	15-2	D-5	QST	VROJ37	2OST-1.10-Stroke & Time Open/Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*MOV157-1	2	A	18	Butterfly	O	15-2	E-3	QST	VROJ37	2OST-1.10-Stroke & Time Open/Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*MOV157-2	2	A	18	Butterfly	O	15-2	E-4	QST	VROJ37	2OST-1.10-Stroke & Time Open/Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2CCP*AOV171	3	B	3	Globe	O	15-2	E-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*AOV172	3	B	3	Globe	O	15-2	D-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*AOV173	3	B	3	Globe	O	15-2	C-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*AOV174	3	B	3	Globe	O	15-2	B-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*MOV175-1	3	B	10	Butterfly	O	15-5	A-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*MOV175-2	3	B	10	Butterfly	O	15-5	A-5	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*MOV176-1	3	B	10	Butterfly	O	15-5	A-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*MOV176-2	3	B	10	Butterfly	O	15-5	A-5	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*MOV177-1	3	B	10	Butterfly	O	15-5	G-5	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Primary Component Cooling Water **SYSTEM NUMBER:** 15

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CCP*MOV177-2	3	B	10	Butterfly	O	15-5	G-5	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*MOV178-1	3	B	10	Butterfly	O	15-5	G-5	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*MOV178-2	3	B	10	Butterfly	O	15-5	G-5	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2CCP*289	3	A/C	2	Check		15-3	C-1	QS	VROJ38	2BVT 1.60.6-FS,RD By Leak Test (R)
								LT		2BVT 1.60.6-Leak Test (2 YR)
2CCP*290	3	A/C	2	Check		15-3	F-1	QS	VROJ38	2BVT 1.60.6-FS,RD By Leak Test (R)
								LT		2BVT 1.60.6-Leak Test (2 YR)
2CCP*291	3	A/C	2	Check		15-3	F-6	QS	VROJ38	2BVT 1.60.6-FS,RD By Leak Test (R)
								LT		2BVT 1.60.6-Leak Test (2 YR)
2CCP*321	3	B	2	Butterfly	LO	15-1	B-3	QS		2OST-15.1-Stroke Only Closed (Q)
2CCP*322	3	B	2	Butterfly	LO	15-1	F-3	QS		2OST-15.2-Stroke Only Closed (Q)
2CCP*323	3	B	2	Gate	LO	15-1	C-3	QS		2OST-15.1-Stroke Only Closed (Q)
2CCP*324	3	B	20	Butterfly	O	15-1	E-3	QS		2OST-15.2-Stroke Only Closed (Q)
2CCP*325	3	B	20	Butterfly	O	15-1	C-3	QS		2OST-15.1-Stroke Only Closed (Q)
2CCP*326	3	B	2	Butterfly	LO	15-1	E-3	QS		2OST-15.2-Stroke Only Closed (Q)
2CCP*352	3	C	2	Check		15-2	A-1	QS	VROJ39	2BVT 1.60.6-FS,RD By Leak Test (R)
2CCP*354	3	B	20	Butterfly	O	15-1	E-8	QS	VCSJ15	2OST-1.10-Stroke Only Closed (CSD)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Primary Component Cooling Water **SYSTEM NUMBER:** 15

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2CCP*355	3	B	20	Butterfly	O	15-1	D-8	QS	VCSJ15	2OST-1 10-Stroke Only Closed (CSD)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Fuel Pool Cooling & Purification **SYSTEM NUMBER:** 20

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2FNC*9	2	A/P	6	Ball	LS	20-1	E-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2FNC*38	2	A/P	6	Ball	LS	20-1	E-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2FNC*121	2	A/P	6	Ball	LS	20-1	D-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2FNC*122	2	A/P	6	Ball	LS	20-1	F-2	LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Main Steam **SYSTEM NUMBER:** 21

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2MSS*18	3	C	3	Check		21-2	A-3	QS		2OST-24.4-PS,FD (Q)
								QS	VCSJ16	2OST-24.4-FS,FD (CSD)
								QS	VROJ40	2BVT 1 60.6-FS,RD By Leak Test (R)
2MSS*19	3	C	3	Check		21-2	C-2	QS		2OST-24.4-PS,FD (Q)
								QS	VCSJ16	2OST-24.4-FS,FD (CSD)
								QS	VROJ40	2BVT 1.60.6-FS,RD By Leak Test (R)
2MSS*20	3	C	3	Check		21-2	D-2	QS		2OST-24.4-PS,FD (Q)
								QS	VCSJ16	2OST-24.4-FS,FD (CSD)
								QS	VROJ40	2BVT 1.60.6-FS,RD By Leak Test (R)
2MSS*AOV101A	2	B	32	Globe	O	21-1	G-7	QS		2OST-21.1 Partial Stroked Closed Only (Q)
								QST	VCSJ17	2OST-21 7-Stroke, Time & Fail Closed (CSD),(RPV)
2MSS*AOV101B	2	B	32	Globe	O	21-1	D-7	QS		2OST-21.2-Partial Stroked Closed Only (Q)
								QST	VCSJ17	2OST-21.7-Stroke, Time & Fail Closed (CSD),(RPV)
2MSS*AOV101C	2	B	32	Globe	O	21-1	B-7	QS		2OST-21.3-Partial Stroked Closed Only (Q)
								QST	VCSJ17	2OST-21.7-Stroke, Time & Fail Closed (CSD),(RPV)
2MSS*SV101A	2	C	6x10	Safety		21-1	F-5	SPT		2BVT 1.60 5 & 2BVT 1 21.2-(5 YR)
2MSS*SV101B	2	C	6x10	Safety		21-1	C-5	SPT		2BVT 1 60 5 & 2BVT 1.21.2-(5 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Main Steam **SYSTEM NUMBER:** 21

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2MSS*SV101C	2	C	6x10	Safety		21-1	A-5	SPT		2BVT 1 60.5 & 2BVT 1 21.2-(5 YR)
2MSS*AOV102A	2	B	2	Globe	S	21-1	G-7	QST		2OST-47 3B-Stroke & Time Closed (Q),(RPV)
2MSS*AOV102B	2	B	2	Globe	S	21-1	E-7	QST		2OST-47 3B-Stroke & Time Closed (Q),(RPV)
2MSS*AOV102C	2	B	2	Globe	S	21-1	C-7	QST		2OST-47 3B-Stroke & Time Closed (Q),(RPV)
2MSS*SV102A	2	C	6x10	Safety		21-1	F-5	SPT		2BVT 1 60.5 & 2BVT 1 21.2-(5 YR)
2MSS*SV102B	2	C	6x10	Safety		21-1	C-5	SPT		2BVT 1.60 5 & 2BVT 1 21.2-(5 YR)
2MSS*SV102C	2	C	6x10	Safety		21-1	A-5	SPT		2BVT 1.60 5 & 2BVT 1.21.2-(5 YR)
2MSS*SV103A	2	C	6x10	Safety		21-1	F-4	SPT		2BVT 1.60.5 & 2BVT 1.21.2-(5 YR)
2MSS*SV103B	2	C	6x10	Safety		21-1	C-4	SPT		2BVT 1.60 5 & 2BVT 1.21.2-(5 YR)
2MSS*SV103C	2	C	6x10	Safety		21-1	A-4	SPT		2BVT 1.60.5 & 2BVT 1.21.2-(5 YR)
2MSS*SV104A	2	C	6x10	Safety		21-1	F-4	SPT		2BVT 1.60 5 & 2BVT 1 21.2-(5 YR)
2MSS*SV104B	2	C	6x10	Safety		21-1	C-4	SPT		2BVT 1.60 5 & 2BVT 1.21.2-(5 YR)
2MSS*SV104C	2	C	6x10	Safety		21-1	A-4	SPT		2BVT 1.60.5 & 2BVT 1.21.2-(5 YR)
2MSS*SOV105A	2	B	3	Globe	S	21-2	D-1	QST		2OST-24 4-Stroke & Time Open/Closed (Q),(RPV) 2OST-47 3B-Stroke & Time Open/Closed (Q in Modes 4-6)
2MSS*SOV105B	2	B	3	Globe	S	21-2	C-1	QST		2OST-24 4-Stroke & Time Open/Closed (Q),(RPV) 2OST-47 3B-Stroke & Time Open/Closed (Q in Modes 4-6)
2MSS*SOV105C	2	B	3	Globe	S	21-2	A-1	QST		2OST-24 4-Stroke & Time Open/Closed (Q),(RPV) 2OST-47 3B-Stroke & Time Open/Closed (Q in Modes 4-6)
2MSS*SOV105D	2	B	3	Globe	S	21-2	D-2	QST		2OST-24 4-Stroke & Time Open/Closed (Q),(RPV) 2OST-47 3B-Stroke & Time Open/Closed (Q in Modes 4-6)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Main Steam **SYSTEM NUMBER:** 21

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2MSS*SOV105E	2	B	3	Globe	S	21-2	C-2	QST		2OST-24.4-Stroke & Time Open/Closed (Q),(RPV) 2OST-47.3B-Stroke & Time Open/Closed (Q in Modes 4-6)
2MSS*SOV105F	2	B	3	Globe	S	21-2	A-2	QST		2OST-24.4-Stroke & Time Open/Closed (Q),(RPV) 2OST-47.3B-Stroke & Time Open/Closed (Q in Modes 4-6)
2MSS*SV105A	2	C	6x10	Safety		21-1	F-3	SPT		2BVT 1.60.5 & 2BVT 1.21.2-(5 YR)
2MSS*SV105B	2	C	6x10	Safety		21-1	C-3	SPT		2BVT 1.60.5 & 2BVT 1.21.2-(5 YR)
2MSS*SV105C	2	C	6x10	Safety		21-1	A-3	SPT		2BVT 1.60.5 & 2BVT 1.21.2-(5 YR)
2MSS*SOV120	2	B	¾	Globe	S	21-2	G-5	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2MSS*196	3	C	3	Check		21-2	D-3	QS		2OST-24.4-PS,FD (Q)
								QS	VCSJ16	2OST-24.4-FS,FD (CSD)
								QS	VROJ40	2BVT 1.60.6-FS,RD By Leak Test (R)
2MSS*199	3	C	3	Check		21-2	C-3	QS		2OST-24.4-PS,FD (Q)
								QS	VCSJ16	2OST-24.4-FS,FD (CSD)
								QS	VROJ40	2BVT 1.60.6-FS,RD By Leak Test (R)
2MSS*352	3	C	3	Check		21-2	A-2	QS		2OST-24.4-PS,FD (Q)
								QS	VCSJ16	2OST-24.4-FS,FD (CSD)
								QS	VROJ40	2BVT 1.60.6-FS,RD By Leak Test (R)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Main Steam (Drains) **SYSTEM NUMBER:** 21

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SDS*AOV111A1	2	B	1½	Globe	O	21-3	A-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SDS*AOV111A2	2	B	1½	Globe	O	21-3	B-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SDS*AOV111B1	2	B	1½	Globe	O	21-3	A-6	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SDS*AOV111B2	2	B	1½	Globe	O	21-3	B-6	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SDS*AOV111C1	2	B	1½	Globe	O	21-3	B-8	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SDS*AOV111C2	2	B	1½	Globe	O	21-3	B-8	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SDS*AOV129A	2	B	1	Globe	O	21-3	C-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SDS*AOV129B	2	B	1	Globe	O	21-3	B-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Main Steam (Vents) **SYSTEM NUMBER:** 21

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SVS*80	2	C	6	Check		21-2	F-8	QS	VROJ51	Sample Disassembly & Inspection per 1/2 CMP-75-ENERTECH CHECK-1M-FS, FD(R)
								QS	VROJ41	2BVT 1.60.6-FS,RD By Leak Test (R)
2SVS*81	2	C	6	Check		21-2	F-9	QS	VROJ51	Sample Disassembly & Inspection per 1/2 CMP-75-ENERTECH CHECK-1M-FS, FD(R)
								QS	VROJ41	2BVT 1.60.6-FS,RD By Leak Test (R)
2SVS*82	2	C	6	Check		21-2	F-10	QS	VROJ51	Sample Disassembly & Inspection per 1/2 CMP-75-ENERTECH CHECK-1M-FS, FD(R)
								QS	VROJ41	2BVT 1.60.6-FS,RD By Leak Test (R)
2SVS*PCV101A	2	B	10	Globe	S	21-1	F-4	QST	VCSJ19	2OST-1.10-Stroke & Time Open/Closed and Fail Closed (CSD),(RPV)
2SVS*PCV101B	2	B	10	Globe	S	21-1	D-4	QST	VCSJ19	2OST-1.10-Stroke & Time Open/Closed and Fail Closed (CSD),(RPV)
2SVS*PCV101C	2	B	10	Globe	S	21-1	B-4	QST	VCSJ19	2OST-1.10-Stroke & Time Open/Closed and Fail Closed (CSD),(RPV)
2SVS*HCV104	2	B	10	Globe	S	21-2	F-7	QST	VCSJ20	2OST-1.10-Stroke & Time Open/Closed and Fail Closed (CSD),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Main Feedwater **SYSTEM NUMBER:** 24

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2FWS*28	2	C	16	Check		24-2A	F-7	QS	VROJ42	2OST-24.8-FS,RD By Leak Test (R)
2FWS*29	2	C	16	Check		24-2A	D-7	QS	VROJ42	2OST-24.8-FS,RD By Leak Test (R)
2FWS*30	2	C	16	Check		24-2A	B-7	QS	VROJ42	2OST-24.8-FS,RD By Leak Test (R)
2FWS*HYV157A	2	B	16	Gate	O	24-2A	F-6	QST	VCSJ21	2OST-1.10-Stroke & Time Closed (CSD),(RPV)
2FWS*HYV157B	2	B	16	Gate	O	24-2A	D-6	QST	VCSJ21	2OST-1.10-Stroke & Time Closed (CSD),(RPV)
2FWS*HYV157C	2	B	16	Gate	O	24-2A	B-6	QST	VCSJ21	2OST-1.10-Stroke & Time Closed (CSD),(RPV)
2FWS*FCV478	3	B	16	Globe	T	24-2A	F-3	QST	VCSJ22	2OST-1.10-Stroke, Time & Fail Closed (CSD),(RPV)
2FWS*FCV479	2	B	6	Globe	S	24-2A	E-3	QST		2OST-47.3B-Stroke, Time & Fail Closed (Q),(RPV)
2FWS*FCV488	3	B	16	Globe	T	24-2A	D-3	QST	VCSJ22	2OST-1.10-Stroke, Time & Fail Closed (CSD),(RPV)
2FWS*FCV489	2	B	6	Globe	S	24-2A	C-3	QST		2OST-47.3B-Stroke, Time & Fail Closed (Q),(RPV)
2FWS*FCV498	3	B	16	Globe	T	24-2A	B-3	QST	VCSJ22	2OST-1.10-Stroke, Time & Fail Closed (CSD),(RPV)
2FWS*FCV499	2	B	6	Globe	S	24-2A	A-3	QST		2OST-47.3B-Stroke, Time & Fail Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Auxiliary Feedwater **SYSTEM NUMBER:** 24

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2FWE*42A	2	A/C	4	Check		24-3	A-8	QS	VCSJ23	2OST-24.6-FS,FD,RD (CSD)
								LM		Monitored shiftly by 2OM-54.3, Station Log PAB 2
2FWE*42B	2	A/C	4	Check		24-3	B-8	QS	VCSJ23	2OST-24.6-FS,FD,RD (CSD)
								LM		Monitored shiftly by 2OM-54.3, Station Log PAB 2
2FWE*43A	2	A/C	4	Check		24-3	C-8	QS	VCSJ23	2OST-24.6-FS,FD,RD (CSD)
								LM		Monitored shiftly by 2OM-54.3, Station Log PAB 2
2FWE*43B	2	A/C	4	Check		24-3	C-8	QS	VCSJ23	2OST-24.6-FS,FD,RD (CSD)
								LM		Monitored shiftly by 2OM-54.3, Station Log PAB 2
2FWE*44A	2	A/C	4	Check		24-3	D-8	QS	VCSJ23	2OST-24.6-FS,FD,RD (CSD)
								LM		Monitored shiftly by 2OM-54.3, Station Log PAB 2
2FWE*44B	2	A/C	4	Check		24-3	E-8	QS	VCSJ23	2OST-24.6-FS,FD,RD (CSD)
								LM		Monitored shiftly by 2OM-54.3, Station Log PAB 2
2FWE*90	3	B	6	Butterfly	LS	24-3	D-2	QS		2OST-24.1-Stroke Only Open (Q)(M per Tech Specs)
2FWE*91	3	B	4	Butterfly	LS	24-3	E-2	QS		2OST-24.1-Stroke Only Open (Q)(M per Tech Specs)
2FWE*92	3	B	4	Butterfly	LS	24-3	F-2	QS		2OST-24.1-Stroke Only Open (Q)(M per Tech Specs)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Auxiliary Feedwater **SYSTEM NUMBER:** 24

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2FWE*99	2	C	4	Check		24-3	B-10	QS	VCSJ24	2OST-24.6-FS,FD (CSD)
								QS	VROJ43	2OST-24.8A-FS,RD By Leak Test (R)
2FWE*100	2	C	4	Check		24-3	C-10	QS	VCSJ24	2OST-24.6-FS,FD (CSD)
								QS	VROJ43	2OST-24.8A-FS,RD By Leak Test (R)
2FWE*HCV100A	2	B	3	Globe	O	24-3	D-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2FWE*HCV100B	2	B	3	Globe	O	24-3	E-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2FWE*HCV100C	2	B	3	Globe	O	24-3	C-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2FWE*HCV100D	2	B	3	Globe	O	24-3	C-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2FWE*HCV100E	2	B	3	Globe	O	24-3	A-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2FWE*HCV100F	2	B	3	Globe	O	24-3	B-7	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
2FWE*SOV100A	3	B	2	Globe	O	24-3	D-2	QST		2OST-47.3B-Stroke & Time Closed (Q) 2OST-1.10-(RPV)
2FWE*SOV100B	3	B	2	Globe	O	24-3	D-2	QST		2OST-47.3B-Stroke & Time Closed (Q) 2OST-1.10-(RPV)
2FWE*101	2	C	4	Check		24-3	E-10	QS	VCSJ24	2OST-24.6-FS,FD (CSD)
								QS	VROJ43	2OST-24.8A-FS,RD By Leak Test (R)
2FWE*RV101	3	C	3x4	Relief		24-3	D-5	SPT		2BVT 1.60.5-(10 YR)
2FWE*RV102	3	C	¾x1	Relief		24-3	E-2	SPT		2BVT 1.60.5-(10 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Auxiliary Feedwater **SYSTEM NUMBER:** 24

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2FWE*FCV122	3	B	6	(NOTE 1)		24-3	E-5	QS		2OST-24.4-Stroke Only Open (Q)
								QS	VCSJ25	2OST-24.4-Stroke Only Closed (CSD)
	3	C	6	Check		24-3	E-5	QS	VCSJ25	2OST-24.4-FS,FD (CSD)
								QS	VCSJ25	2OST-24.6-FS,RD (CSD)
2FWE*FCV123A	3	B	4	(NOTE 1)		24-3	F-6	QS		2OST-24.2-Stroke Only Open (Q)
								QS	VCSJ25	2OST-24.6-Stroke Only Closed (CSD)
	3	C	4	Check		24-3	F-6	QS	VCSJ25	2OST-24.6-FS,FD (CSD)
								QS	VCSJ25	2OST-24.6-FS,RD (CSD)
2FWE*FCV123B	3	B	4	(NOTE 1)		24-3	G-6	QS		2OST-24.3-Stroke Only Open (Q)
								QS	VCSJ25	2OST-24.6-Stroke Only Closed (CSD)
	3	C	4	Check		24-3	G-6	QS	VCSJ25	2OST-24.6-FS,FD (CSD)
								QS	VCSJ25	2OST-24.6-FS,RD (CSD)

NOTE 1: Yarway automatic recirculation control valve acts as both a manual automatic flow control valve and check valve.

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Steam Generator Blowdown **SYSTEM NUMBER:** 25

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2BDG*AOV100A1	2	B	3	Globe	O	25-1	G-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2BDG*AOV100B1	2	B	3	Globe	O	25-1	E-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2BDG*AOV100C1	2	B	3	Globe	O	25-1	B-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2BDG*AOV101A1	2	B	3	Globe	O	25-1	G-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2BDG*AOV101A2	2	B	3	Globe	O	25-1	G-3	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2BDG*AOV101B1	2	B	3	Globe	O	25-1	E-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2BDG*AOV101B2	2	B	3	Globe	O	25-1	E-3	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2BDG*AOV101C1	2	B	3	Globe	O	25-1	B-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2BDG*AOV101C2	2	B	3	Globe	O	25-1	B-3	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Auxiliary Steam **SYSTEM NUMBER:** 27

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2ASS*AOV130A	3	B	8	Globe	O	27A-1	F-4	QST		2OST-47 3B-Stroke & Time Closed (Q),(RPV)
2ASS*AOV130B	3	B	8	Globe	O	27A-1	F-4	QST		2OST-47 3B-Stroke & Time Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Service Water **SYSTEM NUMBER:** 30

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SWS*57	3	C	30	Check		30-1	C-3	QS		2OST-30 2-PS,FD (Q)
								QS	VROJ44	2OST-30 2-FS,FD (Q or R) 2OST-30 13A-FS,FD (R)
								QS	VCSJ26	2OST-30 6-FS,RD (Q or CSD)
2SWS*58	3	C	30	Check		30-1	D-4	QS		2OST-30.3-PS,FD (Q)
								QS	VROJ44	2OST-30 3-FS,FD (Q or R) 2OST-30.13B-FS,FD (R)
								QS	VCSJ26	2OST-30.6-FS,RD (Q or CSD)
2SWS*59	3	C	30	Check		30-1	G-3	QS		2OST-30.6-PS,FD (Q)
								QS	VROJ44	2OST-30.6-FS,FD (Q or R) 2OST-30.13A(B)-FS,FD (R)
								QS	VCSJ26	2OST-30.6-FS,RD (Q or CSD)
2SWS*99	3	B	3	Globe	T	30-2	B-3	QS		2OST-47.3B-Stroke Only Closed (Q)
2SWS*100	3	B	3	Globe	T	30-2	E-3	QS		2OST-47.3B-Stroke Only Closed (Q)
2SWS*RV101A	3	C	¼x1	Relief		30-3	A-1	SPT		2BVT 1.60.5-(10 YR)
2SWS*RV101B	3	C	¼x1	Relief		30-3	E-1	SPT		2BVT 1.60.5-(10 YR)
2SWS*RV101C	3	C	¼x1	Relief		30-3	B-1	SPT		2BVT 1.60.5-(10 YR)
2SWS*RV101D	3	C	¼x1	Relief		30-3	D-1	SPT		2BVT 1.60.5-(10 YR)
2SWS*MOV102A	3	B	30	Butterfly	O	30-1	C-4	QST	VCSJ27	2OST-30.6-Stroke & Time Open (Q or CSD),(RPV)
2SWS*RV102A	3	C	¼x1	Relief		30-3	B-6	SPT		2BVT 1.60.5-(10 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Service Water **SYSTEM NUMBER:** 30

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SWS*MOV102B	3	B	30	Butterfly	O	30-1	D-4	QST	VCSJ27	2OST-30.6-Stroke & Time Open (Q or CSD),(RPV)
2SWS*RV102B	3	C	¼x1	Relief		30-3	F-6	SPT		2BVT 1.60.5-(10 YR)
2SWS*MOV102C1	3	B	30	Butterfly	S	30-1	G-4	QST	VCSJ27	2OST-30.6-Stroke & Time Open (Q or CSD),(RPV)
2SWS*MOV102C2	3	B	30	Butterfly	S	30-1	G-4	QST	VCSJ27	2OST-30.6-Stroke & Time Open (Q or CSD),(RPV)
2SWS*RV102C	3	C	¼x1	Relief		30-3	D-6	SPT		2BVT 1.60.5-(10 YR)
2SWS*MOV103A	3	B	24	Butterfly	S	30-1	C-7	QST	VROJ46	2OST-30.13A-Stroke & Time Open/Closed (R),(RPV)
2SWS*MOV103B	3	B	24	Butterfly	S	30-1	C-6	QST	VROJ46	2OST-30.13B-Stroke & Time Open/Closed (R),(RPV)
2SWS*MOV104A	3	B	16	Gate	O	30-3	A-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWS*MOV104B	3	B	16	Gate	O	30-3	E-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWS*MOV104C	3	B	16	Gate	O	30-3	C-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWS*MOV104D	3	B	16	Gate	O	30-3	D-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWS*MOV105A	3	B	16	Gate	O(T)	30-3	A-3	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWS*MOV105B	3	B	16	Gate	O(T)	30-3	E-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWS*MOV105C	3	B	16	Gate	O(T)	30-3	C-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWS*MOV105D	3	B	16	Gate	O(T)	30-3	D-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Service Water **SYSTEM NUMBER:** 30

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SWS*106	3	C	30	Check		30-1	A-7	QS		2OST-30.2(6)-PS,FD (Q)
								QS	VROJ45	2OST-30.2(6)-FS,FD (Q or R) 2OST-30.13A-FS,FD (R)
								QS	VROJ45	2OST-30.8A-FS,RD By Leak Test (R)
2SWS*MOV106A	3	B	30	Butterfly	O	30-1	C-7	QST	VROJ47	2OST-1.10-Stroke & Time Open/Closed (CSD),(RPV) 2OST-30.13A-Stroke & Time Open/Closed (R),(RPV)
2SWS*MOV106B	3	B	30	Butterfly	O	30-1	C-6	QST	VROJ47	2OST-1.10-Stroke & Time Open/Closed (CSD),(RPV) 2OST-30.13B-Stroke & Time Open/Closed (R),(RPV)
2SWS*107	3	C	30	Check		30-1	A-6	QS		2OST-30.3(6)-PS,FD (Q)
								QS	VROJ45	2OST-30.3(6)-FS,FD (Q or R) 2OST-30.13B-FS,FD (R)
								QS	VROJ45	2OST-30.8B-FS,RD By Leak Test (R)
2SWS*MOV107A	3	B	24	Butterfly	O	30-1	F-7	QST	VCSJ28	2OST-1.10-Stroke & Time Closed (CSD),(RPV)
2SWS*MOV107B	3	B	24	Butterfly	O	30-1	F-7	QST	VCSJ28	2OST-1.10-Stroke & Time Closed (CSD),(RPV)
2SWS*MOV107C	3	B	24	Butterfly	O	30-1	F-6	QST	VCSJ28	2OST-1.10-Stroke & Time Closed (CSD),(RPV)
2SWS*MOV107D	3	B	24	Butterfly	O	30-1	F-6	QST	VCSJ28	2OST-1.10-Stroke & Time Closed (CSD),(RPV)
2SWS*110	3	C/P	6	Check		30-2	C-8	NA		*(Internal Inspection per CMP (5 years))
2SWS*111	3	C	6	Check		30-2	C-8	QS		2OST-36.1-FS,FD (Q) *(Internal Inspection per CMP (5 years))
2SWS*112	3	C	6	Check		30-2	E-8	QS		2OST-36.2-FS,FD (Q) *(Internal Inspection per CMP (5 years))
2SWS*113	3	C/P	6	Check		30-2	E-8	NA		*(Internal Inspection per CMP (5 years))

*Not required by ASME. Performed by 1/2CMP-75-WAFER CHECK-1M to verify valve integrity per NRC IE Bulletin 83-03

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Service Water **SYSTEM NUMBER:** 30

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SWS*MOV113A	3	B	6	Gate	S	30-2	C-8	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2SWS*MOV113D	3	B	6	Gate	S	30-2	E-8	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2SWS*115A	3	B	1½	Ball	S	30-1	B-2	QS		2OST-30.17A-Stroke to Open Throttled Position (Q)
2SWS*115B	3	B	1½	Ball	S	30-1	F-2	QS		2OST-30.17B-Stroke to Open Throttled Position (Q)
2SWS*AOV118A	3	B	2	Globe	O	30-1	B-1	QST		2OST-30.17A-Stroke & Time Closed (Q),(RPV)
2SWS*AOV118B	3	B	2	Globe	O	30-1	E-1	QST		2OST-30.17B-Stroke & Time Closed (Q),(RPV)
2SWS*AOV130A	3	B	2	Globe	O(A)	30-1	A-4	QST		2OST-30.17A-Stroke & Time Open (Q)
2SWS*AOV130B	3	B	2	Globe	O(A)	30-1	E-4	QST		2OST-30.17B-Stroke & Time Open (Q)
2SWS*142	3	B	3	Gate	S	30-2	A-1	QS		2OST-47.3B-Stroke Only Open (Q)
2SWS*143	3	B	3	Gate	S	30-2	F-1	QS		2OST-47.3B-Stroke Only Open (Q)
2SWS*RV152	2	A/C	¾x1	Relief		29-4	A-2	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*MOV152-1	2	A	8	Butterfly	O	29-4	A-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*MOV152-2	2	A	8	Butterfly	O	29-4	A-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Service Water **SYSTEM NUMBER:** 30

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SWS*RV153	2	A/C	¼	Relief		29-4	C-2	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*MOV153-1	2	A/P	8	Butterfly	LS	29-4	C-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*MOV153-2	2	A/P	8	Butterfly	LS	29-4	C-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*RV154	2	A/C	¾x1	Relief		29-4	D-2	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*MOV154-1	2	A/P	8	Butterfly	LS	29-4	D-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*MOV154-2	2	A/P	8	Butterfly	LS	29-4	D-2	LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*RV155	2	A/C	¾x1	Relief		29-4	G-2	SPT		2BVT 1.60.5-(10 YR)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*MOV155-1	2	A	8	Butterfly	O	29-4	G-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*MOV155-2	2	A	8	Butterfly	O	29-4	G-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2SWS*486	3	C	3	Check		30-1	C-3	QS		2OST-30.2-FS,RD (Q)
								QS	VCSJ29	2OST-30.6-FS,FD (Q or CSD)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Service Water **SYSTEM NUMBER:** 30

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SWS*487	3	C	3	Check		30-1	D-3	QS		2OST-30.3-FS,RD (Q)
								QS	VCSJ29	2OST-30.6-FS,FD (Q or CSD)
2SWS*488	3	C	3	Check		30-1	G-3	QS		2OST-30.6-FS,RD (Q)
								QS	VCSJ29	2OST-30.6-FS,FD (Q or CSD)
2SWS*1103	3	C	4	Check		30-2	A-4	QS	VROJ48	2BVT 1.60.6-FS,RD By Leak Test (R)
2SWS*1104	3	C	4	Check		30-2	G-4	QS	VROJ48	2BVT 1.60.6-FS,RD By Leak Test (R)
2SWS*1166	3	C	2	Check		30-1	B-5	QS		2OST-47.3B-FS,RD (Q)
2SWS*1167	3	C	2	Check		30-1	B-7	QS		2OST-47.3B-FS,RD (Q)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Service Water (Chlorine Injection) **SYSTEM NUMBER:** 30

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SWM*MOV562	3	B	3	Plug	S	30-1	B-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWM*MOV563	3	B	3	Plug	S	30-1	B-6	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWM*MOV564	3	B	3	Plug	S	30-1	B-6	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2SWM*MOV565	3	B	3	Plug	S	30-1	B-7	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Standby Service Water **SYSTEM NUMBER:** 30

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SWE*MOV116A	3	B	30	Butterfly	S	30-1	A-7	QST		2OST-30.1A-Stroke & Time Open/Closed (Q),(RPV)
2SWE*MOV116B	3	B	30	Butterfly	S	30-1	A-6	QST		2OST-30.1B-Stroke & Time Open/Closed (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Fire Protection — SYSTEM NUMBER: 33

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2FPW*AOV204	2	A	2	Globe	S	33-1D	C-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1 47.5-Leak Test (SP)
2FPW*AOV205	2	A	4	Globe	S	33-1D	F-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1 47.5-Leak Test (SP)
2FPW*AOV206	2	A	6	Globe	S	33-1D	D-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2FPW*AOV221	2	A	2	Globe	S	33-1D	A-4	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1 47 5-Leak Test (SP)
2FPW*382	2	A/C	2½	Check		33-1D	C-4	QS	VCSJ30	2OST-1.10 or 2BVT 1 47.3-FS,RD by observation of mechanical weight loaded swing arm (CSD)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2FPW*388	2	A/C	2½	Check		33-1D	A-4	QS	VCSJ30	2OST-1 10 or 2BVT 1.47.3-FS,RD by observation of mechanical weight loaded swing arm (CSD)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2FPW*753	2	A/C	4	Check		33-1D	F-4	QS	VCSJ30	2OST-1.10 or 2BVT 1.47.3-FS,RD by observation of mechanical weight loaded swing arm (CSD)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2FPW*761	2	A/C	6	Check		33-1D	D-4	QS	VROJ54	2BVT 1 47.3-FS,RD by observation of mechanical weight loaded swing arm (R)
								LTJ		2BVT 1 47 5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Compressed Air (Containment Instrument Air) **SYSTEM NUMBER:** 34

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2IAC*22	2	A/C	3	Check		34-3	C-10	QS	VROJ49	2BVT 1.47.3-FS,RD by observation of mechanical weight loaded swing arm (R)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2IAC*MOV130	2	A	3	Plug	O	34-3	C-10	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2IAC*MOV133	2	A	4	Plug	O	34-3	C-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2IAC*MOV134	2	A	4	Plug	O	34-3	C-1	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Compressed Air (Station Air) **SYSTEM NUMBER:** 34

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2SAS*14	2	A/P	2	Globe	LS	34-1B	C-6	LTJ		2BVT 1.47.5-Leak Test (SP)
2SAS*15	2	A/P	2	Globe	LS	34-1B	C-6	LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: 4KV Station Service (Diesel Air Start) **SYSTEM NUMBER:** 36

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2EGA*100	3	C	¾	Check		36-3	E-4	QS		2OST-47.3B-FS,RD (Q)
2EGA*101	3	C	¾	Check		36-3	F-4	QS		2OST-47.3B-FS,RD (Q)
2EGA*118	3	C	½	Check (Excess Flow)		36-3	E-4	QS		2OST-47.3B-Closure Test (Q)
2EGA*119	3	C	½	Check (Excess Flow)		36-3	F-4	QS		2OST-47.3B-Closure Test (Q)
2EGA*130	3	C	¾	Check		36-3	E-9	QS		2OST-47.3B-FS,RD (Q)
2EGA*131	3	C	¾	Check		36-3	F-9	QS		2OST-47.3B-FS,RD (Q)
2EGA*155	3	C	½	Check (Excess Flow)		36-3	E-9	QS		2OST-47.3B-Closure Test (Q)
2EGA*156	3	C	½	Check (Excess Flow)		36-3	F-9	QS		2OST-47.3B-Closure Test (Q)
2EGA*SOV202-1	3	B	2	Three-way		36-3	A-5	QST	VRR2	2OST-36.1-Stroke & Time Open (Q)
2EGA*SOV202-2	3	B	2	Three-way		36-3	B-5	QST	VRR2	2OST-36.1-Stroke & Time Open (Q)
2EGA*SOV203-1	3	B	2	Three-way		36-3	A-10	QST	VRR2	2OST-36.2-Stroke & Time Open (Q)
2EGA*SOV203-2	3	B	2	Three-way		36-3	B-10	QST	VRR2	2OST-36.2-Stroke & Time Open (Q)
2EGA*RV205	3	C	½	Relief		36-3	E-4	SPT		2BVT 1.60.5-(10 YR)
2EGA*RV206	3	C	½	Relief		36-3	E-9	SPT		2BVT 1.60.5-(10 YR)
2EGA*RV207	3	C	½	Relief		36-3	F-4	SPT		2BVT 1.60.5-(10 YR)
2EGA*RV208	3	C	½	Relief		36-3	F-9	SPT		2BVT 1.60.5-(10 YR)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: 4KV Station Service (Diesel Fuel Oil) **SYSTEM NUMBER:** 36

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2EGF*7	3	C	3	Check		36-1	F-1	QS		2OST-36 1-FS,FD,RD (Q)
2EGF*8	3	C	3	Check		36-1	F-6	QS		2OST-36 2-FS,FD,RD (Q)
2EGF*9	3	C	3	Check		36-1	E-1	QS		2OST-36 1-FS,FD,RD (Q)
2EGF*10	3	C	3	Check		36-1	E-6	QS		2OST-36.2-FS,FD,RD (Q)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: 4KV Station Service (Diesel Lube Oil) **SYSTEM NUMBER:** 36

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2EGO*106	3	B	4	Gate	LO	36-5B	F-8	QS		2OST-47.3B-Stroke Only Closed (Q) 2OST-36.4-Stroke Only Closed (R)
2EGO*107	3	B	4	Gate	LO	36-5A	F-8	QS		2OST-47.3B-Stroke Only Closed (Q) 2OST-36.3-Stroke Only Closed (R)
2EGO*108	3	B	4	Gate	LO	36-5B	E-8	QS		2OST-47.3B-Stroke Only Closed (Q) 2OST-36.4-Stroke Only Closed (R)
2EGO*109	3	B	4	Gate	LO	36-5A	E-8	QS		2OST-47.3B-Stroke Only Closed (Q) 2OST-36.3-Stroke Only Closed (R)
2EGO*114	3	B	4	Gate	S	36-5B	F-7	QS		2OST-47.3B-Stroke Only Open (Q) 2OST-36.4-Stroke Only Open (R)
2EGO*115	3	B	4	Gate	S	36-5A	F-7	QS		2OST-47.3B-Stroke Only Open (Q) 2OST-36.3-Stroke Only Open (R)
2EGO*116	3	B	4	Gate	S	36-5B	E-7	QS		2OST-47.3B-Stroke Only Open (Q) 2OST-36.4-Stroke Only Open (R)
2EGO*117	3	B	4	Gate	S	36-5A	E-7	QS		2OST-47.3B-Stroke Only Open (Q) 2OST-36.3-Stroke Only Open (R)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Control Area Ventilation **SYSTEM NUMBER:** 44A

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2HVC*MOD201A	3	B	36	Butterfly	O	44A-2	D-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2HVC*MOD201B	3	B	36	Butterfly	O	44A-2	D-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2HVC*MOD201C	3	B	36	Butterfly	S	44A-2	C-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2HVC*MOD201D	3	B	36	Butterfly	S	44A-2	C-2	QST		2OST-47.3B-Stroke & Time Closed (Q),(RPV)
2HVC*MOD204A	3	B	8	Butterfly	S	44A-2	F-2	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2HVC*MOD204B	3	B	8	Butterfly	S	44A-2	G-2	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment Area Ventilation **SYSTEM NUMBER:** 44C

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2HVR*MOD23A	2	A	42	Butterfly	LS	44C-2	B-5	QST	VCSJ31	2OST-1.10-Stroke & Time Closed (CSD),(RPV) 2OST-44C.1-Stroke & Time Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2HVR*MOD23B	2	A	42	Butterfly	LS	44C-2	B-7	QST	VCSJ31	2OST-1.10-Stroke & Time Closed (CSD),(RPV) 2OST-44C.1-Stroke & Time Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2HVR*MOD25A	2	A	42	Butterfly	LS	44C-2	C-5	QST	VCSJ31	2OST-1.10-Stroke & Time Closed (CSD),(RPV) 2OST-44C.1-Stroke & Time Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2HVR*MOD25B	2	A	42	Butterfly	LS	44C-2	C-7	QST	VCSJ31	2OST-1.10-Stroke & Time Closed (CSD),(RPV) 2OST-44C.1-Stroke & Time Closed (R),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2HVR*DMP206	2	A/P	8	Butterfly	LS	44C-2	D-6	LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Post DBA Hydrogen Control **SYSTEM NUMBER:** 46

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2HCS*110	2	A	2	Ball	LS	46-1	D-2	QS		2OST-47.3B-Stroke Only Open (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2HCS*111	2	A	2	Ball	LS	46-1	G-2	QS		2OST-47.3B-Stroke Only Open (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2HCS*MOV112A	2	B	2	Ball	S	46-1	C-6	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2HCS*MOV112B	2	B	2	Ball	S	46-1	F-6	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2HCS*SOV114A	2	A	2	Globe	S	46-1	B-2	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV114B	2	A	2	Globe	S	46-1	F-2	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV115A	2	A	2	Globe	S	46-1	C-2	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV115B	2	A	2	Globe	S	46-1	F-2	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*MOV116	2	A	2	Ball	S	46-1	D-1	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Post DBA Hydrogen Control **SYSTEM NUMBER:** 46

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2HCS*MOV117	2	A	2	Ball	S	46-1	G-1	QST		2OST-47.3B-Stroke & Time Open/Closed (Q),(RPV)
								LTJ		2BVT 1.47.5-Leak Test (SP)
2HCS*MOV120A	2	B	2	Plug	S	46-1	D-6	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2HCS*MOV120B	2	B	2	Plug	S	46-1	G-6	QST		2OST-47.3B-Stroke & Time Open (Q),(RPV)
2HCS*SOV133A	2	A	¾	Globe	S	46-1	A-1	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV133B	2	A	¾	Globe	S	46-1	D-1	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV134A	2	A	¾	Globe	S	46-1	A-3	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV134B	2	A	¾	Globe	S	46-1	D-3	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV135A	2	A	¾	Globe	S	46-1	E-1	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV135B	2	A	¾	Globe	S	46-1	E-3	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Post DBA Hydrogen Control **SYSTEM NUMBER:** 46

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2HCS*SOV136A	2	A	⅜	Globe	S	46-1	B-1	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)
2HCS*SOV136B	2	A	⅜	Globe	S	46-1	B-3	QST		2OST-47.3B-Stroke & Time Open/Closed (Q)
								LTJ		2BVT 1.47.5-Leak Test (SP),(RPV)

BVPS-2 IST
VALVE OUTLINE

SYSTEM NAME: Containment **SYSTEM NUMBER:** 47

Valve Mark Number	Valve Class	Valve Category	Valve Size (in.)	Valve Type	NSA	Drawing		Test Requirement	VCSJ, VROJ or Relief Requests	Comments
						OM No.	Coord.			
2PHS*100	2	A/P	1 ½	Gate	S	47-1	E-4	LTJ		2BVT 1.47.8-Type B Leak Test (SP)
2PHS*101	2	A/P	1 ½	Gate	S	47-1	E-2	LTJ		2BVT 1.47.8-Type B Leak Test (SP)
2PHS*110	2	A/P	1 ½	Ball	S	47-1	E-4	LTJ		2BVT 1.47.8-Type B Leak Test (SP)
2PHS*111	2	A/P	1 ½	Ball	S	47-1	E-4	LTJ		2BVT 1.47.8-Type B Leak Test (SP)
2PHS*112	2	A/P	1 ½	Ball	S	47-1	E-2	LTJ		2BVT 1.47.8-Type B Leak Test (SP)
2PHS*113	2	A/P	1 ½	Ball	S	47-1	E-2	LTJ		2BVT 1.47.8-Type B Leak Test (SP)
2PHS*201	2	A/P	2	Gate	S	47-1	B-9	LTJ		2BVT 1.47.10-Type B Leak Test (SP)
2PHS*202	2	A/P	2	Gate	S	47-1	B-8	LTJ		2BVT 1.47.10-Type B Leak Test (SP)

SECTION IX: VALVE COLD SHUTDOWN JUSTIFICATIONS

VALVE COLD SHUTDOWN JUSTIFICATION 1

Valve Mark No(s): 2CHS*HCV142

Category: A **Class:** 2

System: 7 - Chemical and Volume Control

Function: This residual heat removal (RHR) system letdown flow control valve must close to provide containment isolation of penetration no. 28.

Test Requirement: Per OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," valves with fail-safe actuators shall be tested by observing the operation of the actuator upon loss of valve actuating power in accordance with the exercising frequency specified in Paragraph 4.2.1.1, "Exercising Test Frequency," which states that active Category A valves shall be tested nominally every 3 months.

Basis for CSJ: This valve is normally closed during plant operation. Its safety position is closed for containment isolation of penetration no. 28. Full-stroke exercising in the closed direction is performed quarterly as required by OM-10, Paragraph 4.2.1.1. Fail-safe testing requires a local observation of the valve actuator following local isolation of its air supply. However, this valve is located inside containment which is not accessible during plant operation. Therefore, fail-safe testing in the closed direction in conjunction with the quarterly stroke test cannot be performed during plant operation. Per OM-10, Paragraphs 4.2.1.6 and 4.2.1.2(c), if the fail-safe exercising frequency is not practicable during plant operation, it may be limited to fail-safe testing during cold shutdowns.

Alternate Test: Full-stroke exercised and timed closed quarterly per 2OST-47.3B (Containment Penetration and ASME XI Valve Test). Failed closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.

VALVE COLD SHUTDOWN JUSTIFICATION 2

Valve Mark No(s): 2CCP*MOV112A
2CCP*MOV112B

Category: B **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These primary component cooling water (CCP) supply to residual heat removal (RHR) heat exchanger isolation valves must open to supply cooling water to the RHR Heat Exchangers and Seal Coolers in order to achieve cold shutdown conditions following an accident.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed during power operation. They are full-stroke exercised and timed open during the quarterly CCP Pump Tests (2OST-15.1, 2 or 3), however, the quarterly testing frequency using these OST's is not practicable during cold shutdowns. During cold shutdowns, these valves are opened when placing the RHR System into service. Once the RHR System is in service, the safety position for these valves is to remain open in order to support cooling of the RHR Heat Exchangers and Seal Coolers. Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these valves cannot be exercised quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop. Failure of any valve to re-open during testing at that time would cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR Pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise the valves. However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to

VALVE COLD SHUTDOWN JUSTIFICATION 2

Basis for CSJ: determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised when placing the RHR system into service during station shutdown and when removing the RHR system from service during station startup. They will also be tested when the plant is defueled, if more than 92 days has passed since they were last tested.

Alternate Test: Full-stroke exercised and timed open quarterly per 2OST-15.1, 2OST-15.2 or 2OST-15.3 (CCP Pump Tests), during power operation. Full-stroke exercised and timed open when placing the RHR system into service during station shutdown to cold shutdown per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests). Full-stroke exercised and timed open when removing the RHR system from service during station startup from cold shutdown, if greater than 92 days will pass until the respective quarterly test is scheduled, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests). They will also be full-stroke exercised and timed open when the plant is defueled per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests), if more then 92 days has passed since they were last tested.

References: OM-10, Paragraph 4.2.1.1.
NUREG-1449.
Technical Specification 3/4.4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 3

Valve Mark No(s): 2RCS*PCV455C
2RCS*PCV455D
2RCS*PCV456

Category: B **Class:** 1

System: 6 - Reactor Coolant

Function: These Pressurizer Power Operated Relief Valves (PORV's) provide overpressure protection for the reactor coolant system (RCS) by limiting system pressure for a large power mismatch.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed. Their safety position is open to provide overpressure protection for the reactor coolant system, however, they are also required to fail closed on a loss of control power. The PORV's are not needed for overpressure protection during power operation since the pressurizer code safety valves fulfill this function. In the event that a PORV was to fail or stick open while being cycled at power, the potential loss of RCS inventory through this relief path could lead to a forced plant shutdown. Since these valves have shown a high probability of sticking and failing open, as recognized in NUREG-1482, Section 4.4.1, "Pressurizer Power-Operated Relief Valve Inservice Testing," provisions for exercising quarterly during power operation is not practical. Therefore, exercising would be performed during cold shutdowns. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open during cold shutdowns per 2OST-6.8 (PORV Operability Test).

In addition, fail-safe testing in the closed direction, as required by NUREG-1482, Section 4.4.1, and OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," is also performed during cold shutdowns each time a valve is returned to its NSA closed position following testing per 2OST-6.8 (PORV Operability Test) as follows: By placing the control switch to the closed position, this de-energizes the solenoid control power which in turn directs RCS pressure to the top of the PORV valve plug which closes the PORV to its fail-safe position.

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.
NUREG-1482, Section 4.4.1.

VALVE COLD SHUTDOWN JUSTIFICATION 4

Valve Mark No(s): 2CHS*84
2CHS*136
2CHS*141

Category: C **Class:** 2,3

System: 7 - Chemical and Volume Control

Function: These emergency and alternate emergency boration line check valves must open to provide a flowpath for 4% boric acid solution from the Boric Acid Tanks via the Boric Acid Transfer Pumps to the suction of the Charging Pumps.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety position is open for emergency and alternate emergency boration. They can be full-stroke exercised in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1. However, testing in this manner at power, either by full or part-stroke exercising, would result in concentrated boric acid solution being injected in the reactor coolant system (RCS). This would cause an undesired negative reactivity addition resulting in a reduction in plant power. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised open during cold shutdowns per 2OST-7.13 (Emergency/Alternate Emergency Boration Flowpath Check Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 5

Valve Mark No(s): 2RHS*3
2RHS*4

Category: C **Class:** 2

System: 10 - Residual Heat Removal

Function: These Residual Heat Removal (RHR) Pump discharge check valves must open to support RHR system operation and must close to prevent reverse flow through the standby RHR Pump.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety position is open to support RHR system operation and closed to prevent reverse flow through the standby RHR Pump. They can be full-stroke exercised in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1, when the RHR Pumps are in operation. However, during plant operation, the RHR system is isolated from the reactor coolant system (RCS) and the RHR Pumps are not required for operation. The RHR Pumps are only operated during cold shutdowns and refueling outages. Therefore, full or part-stroke exercising in the open direction with flow can only be performed during cold shutdowns and refueling outages. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Full-stroke exercising in the closed direction requires closing of the discharge MOV of the idle standby RHR Pump and verifying non-rotation of the idle standby RHR pump by local observation while the other RHR Pump is operating. Because these check valves are located inside containment, they are not accessible to verify closure testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

VALVE COLD SHUTDOWN JUSTIFICATION 5

Basis for CSJ:

Per NUREG-1449, "Shutdown and Low-Power Operation at Commerical Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these check valves cannot be exercised closed quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these check valves cannot be tested closed (because the pump discharge MOV must also be closed) without entering the action statement which requires immediate restoration of the RCS loop. Failure of the pump discharge MOV to re-open would cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise all of the valves. However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised closed when placing the RHR system into service during station shutdown, when removing the RHR system from service during station startup or when the plant is defueled, not more often than once per 92 days.

Alternate Test:

Full-stroke exercised open during cold shutdowns per 2OST-10.1 and 2OST-10.2 (RHR Pump Performance Tests). Full-stroke exercised closed when placing the RHR system into service during station shutdown to cold shutdown, when removing the RHR system from service during station startup from cold shutdown or when the plant is defueled, not more often than once per 92 days, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests).

References:

OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.
NUREG-1449
Technical Specification 3/4.4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 6

Valve Mark No(s): 2RHS*FCV605A
2RHS*FCV605B

Category: B **Class:** 2

System: 10 - Residual Heat Removal

Function: These Residual Heat Removal (RHR) Heat Exchanger bypass flow control valves are normally throttled to control the amount of RHR flow bypassed around the RHR Heat Exchangers thus limiting reactor coolant system (RCS) cooldown. They must close as cooldown continues to ensure all RHR flow is through the RHR Heat Exchangers.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: During plant operation, the RHR system is isolated from the RCS and is not in service. When the RHR system is in service, these flow control valves are normally in a throttled position to control the amount of RHR flow bypassed around the RHR Heat Exchangers. Their safety position is closed and they are required to fail closed on a loss of power. Local observation is required to full-stroke exercise and to fail these valves in the closed position. Because these valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these valves cannot be exercised quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop. Failure of any valve to re-close during testing at that time could cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR Pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise the valves.

VALVE COLD SHUTDOWN JUSTIFICATION 6

Basis for CSJ: However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised when placing the RHR system into service during station shutdown, when removing the RHR system from service during station startup or when the plant is defueled, not more often than once per 92 days.

Alternate Test: Full-stroke exercised and timed closed when placing the RHR system into service during station shutdown to cold shutdown, when removing the RHR system from service during station startup from cold shutdown or when the plant is defueled, not more often than once per 92 days, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests). In addition, these valves will also be failed closed per 2OST-10.3 and 2OST-10.4 as required by OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves."

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.
NUREG-1449.
Technical Specification 3/4.4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 7

Valve Mark No(s):
2RHS*MOV701A
2RHS*MOV701B
2RHS*MOV702A
2RHS*MOV702B
2RHS*MOV720A
2RHS*MOV720B

Category: A **Class:** 1

System: 10 - Residual Heat Removal

Function: These reactor coolant system (RCS) to residual heat removal (RHR) system isolation valves must open to support RHR system operation in attaining cold shutdown conditions. They must close to protect the lower pressure RHR system from overpressurization if RCS pressure rises above 700 psig while the RHR system is in service.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category A valves shall be tested nominally every 3 months.

Basis for CSJ: During plant operation, these valves are closed and must be leak tight to isolate the lower pressure RHR system from the higher pressure RCS. Their safety positions are open to support RHR system operation during shutdown to cold shutdown conditions, and closed to protect the RHR system from overpressurization. Full-stroke exercising during plant operation cannot be performed because they are interlocked closed to prevent overpressurization of the RHR system piping from the higher pressure RCS. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these valves cannot be exercised quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop.

VALVE COLD SHUTDOWN JUSTIFICATION 7

Basis for CSJ: Failure of any valve to re-open during testing at that time would cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR Pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise all of the valves. However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised when placing the RHR system into service during station shutdown, when removing the RHR system from service during station startup or when the plant is defueled, not more often than once per 92 days.

Alternate Test: Full-stroke exercised and timed open and closed when placing the RHR system into service during station shutdown to cold shutdown, when removing the RHR system from service during station startup from cold shutdown or when the plant is defueled, not more often than once per 92 days, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).
NUREG-1449.
Technical Specification 3/4.4.1.3

VALVE COLD SHUTDOWN JUSTIFICATION 8

Valve Mark No(s): 2RHS*HCV758A
2RHS*HCV758B

Category: B **Class:** 2

System: 10 - Residual Heat Removal

Function: These Residual Heat Removal (RHR) Heat Exchanger flow control valves are normally throttled to control the amount of RHR flow through the RHR Heat Exchangers thus limiting reactor coolant system (RCS) cooldown. They must open as cooldown continues to ensure all RHR flow is through the RHR Heat Exchangers.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: During plant operation, the RHR system is isolated from the RCS and is not in service. When the RHR system is in service, these flow control valves are normally in a throttled position to control the amount of RHR flow through the RHR Heat Exchangers. Their safety position is open and they are required to fail open on a loss of power. Local observation is required to full-stroke exercise and to fail these valves in the open position. Because these valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these valves cannot be exercised quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop. Failure of any valve to re-open during testing at that time could cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR Pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise the valves.

VALVE COLD SHUTDOWN JUSTIFICATION 8

Basis for CSJ: However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised when placing the RHR system into service during station shutdown, when removing the RHR system from service during station startup or when the plant is defueled, not more often than once per 92 days.

Alternate Test: Full-stroke exercised and timed open when placing the RHR system into service during station shutdown to cold shutdown, when removing the RHR system from service during station startup from cold shutdown or when the plant is defueled, not more often than once per 92 days, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests). In addition, these valves will also be failed open per 2OST-10.3 and 2OST-10.4 as required by OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves."

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.
NUREG-1449
Technical Specification 3/4.4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 9

Valve Mark No(s): 2SIS*MOV865A
2SIS*MOV865B
2SIS*MOV865C

Category: B **Class:** 2

System: 11 - Safety Injection

Function: These Safety Injection (SI) Accumulator discharge isolation valves must remain open to allow the SI Accumulators to discharge to the reactor coolant system (RCS) in the event of a loss of coolant accident (LOCA). They must close during a small break LOCA to prevent nitrogen from being injected into the RCS.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: During plant operation, these valves are de-energized (shorting bars are removed) in the open position which is their passive safety position. Their safety position is also closed during a small break LOCA to prevent nitrogen from being injected into the RCS. Full-stroke exercising in the open direction is not required per OM-10, Table 1, "Inservice Test Requirements," since the valves are passive in this direction. Full-stroke exercising in the closed direction cannot be performed during plant operation because these valves are required to be open with their shorting bars removed per Technical Specification 4.5.1.c. In addition, failure of any valve to re-open after closure would place the plant in a 1 hour action per Technical Specification 3.5.1 which would require the plant to shutdown. In NUREG-1482, Section 3.1.1, "Deferring Valve Testing to Each Cold Shutdown or Refueling Outage," Example (1) lists the SI Accumulator discharge valves in PWR's as one specific example of valves whose failure in a non-conservative position during the cycling test would cause a loss of system function. Therefore, these valves will not be stroked and timed during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed when the SI Accumulators are isolated from the RCS on the way to cold shutdowns per 2OM-51.4.C (Station Shutdown-Cooldown from Mode 3 to Mode 4), and recorded in 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c), and Table 1.
NUREG-1482, Section 3.1.1.

VALVE COLD SHUTDOWN JUSTIFICATION 10

Valve Mark No(s): 2SIS*HCV868A
2SIS*HCV868B

Category: B **Class:** 2

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) discharge to cold leg injection hand control valves must open and close to provide a throttled emergency boration flowpath when normal charging is lost.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed. Their safety position is throttled to provide an emergency boration flowpath to the cold legs in the event that the normal charging path is lost. Full or part-stroke exercising in the open and closed directions cannot be performed during plant operation because flow is required to properly close these valves. Operation of the HHSI pumps to provide the flow necessary to stroke these valves closed cannot be performed during plant operation because this will inject relatively cold water into the RCS cold legs and cause thermal shock to system piping and components which will result in an increased probability of system and component failures. OM-10, Paragraph 4.2.1.2 (c) states, "If excercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open and closed, and failed closed in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(e)
NUREG-1482, Section 3.1.1.

VALVE COLD SHUTDOWN JUSTIFICATION 11

(DELETED)

VALVE COLD SHUTDOWN JUSTIFICATION 12

Valve Mark No(s): 2QSS*SOV100A
2QSS*SOV100B

Category: A **Class:** 2

System: 13 - Containment Depressurization (Quench Spray)

Function: These quench spray chemical injection to containment sump outside containment isolation valves must close to provide containment isolation of penetration no. 118. They must open following a CIB and low-low Refueling Water Storage Tank (RWST) level to admit a 23% to 25% sodium hydroxide (NaOH) solution to the containment sump for removal of radioactive iodine from the containment atmosphere during Recirculation Spray Pump operation.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category A valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed. Their safety positions are closed for containment isolation of penetration no. 118, and open for injection of NaOH solution to the containment sump following a CIB and low-low level in the RWST. Full or part-stroke exercising in the open and closed directions cannot be performed during plant operation because failure of either valve in the open position would cause NaOH injection flow to be fully or partially diverted away from the suction of the Quench Spray Pumps to the containment sump following a CIB, thus rendering chemical injection inoperable. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open and closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 13

Valve Mark No(s): 2QSS*303
2QSS*304

Category: C **Class:** 2

System: 13 - Containment Depressurization (Quench Spray)

Function: These check valves are located in the quench spray Chemical Injection Pump discharge header to the suction of the Quench Spray Pumps. They must open following a CIB to admit a 23% to 25% sodium hydroxide (NaOH) solution to the suction of the Quench Spray Pumps for removal of radioactive iodine from the containment atmosphere during Quench Spray Pump operation. They must close to prevent diversion of Refueling Water Storage Tank (RWST) water from the quench spray system into the chemical injection system during the recirculation phase of operation or during low Quench Spray Pump discharge flow conditions.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety positions are open following a CIB signal, and closed during the recirculation phase of operation. They can be full-stroke exercised quarterly in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1. However, full-stroke exercising in the closed direction can only be verified by leak testing or by opening [2QSS*SOV100A or B] and observing operation of [2QSS*SOV101A or B] or [2QSS*SOV102A or B] as follows. Verifying check valve closure by leak testing requires opening an upstream vent and collecting a timed leak rate sample, however, this requires draining the entire discharge header first. If leak rate testing was performed quarterly or at cold shutdown, the amount of radioactive water (borated RWST water is used for testing) drained from the discharge header would create additional liquid waste for disposal which is not practical. An alternate method (as discussed above) would require opening [2QSS*SOV100A or B] which can only be opened during cold shutdowns as discussed in VCSJ No. 12. Backleakage through the check valves would open Target Rock SOV's [2QSS*SOV101A or B] or [2QSS*SOV102A or B] due to a differential pressure created by the RWST head to the containment sump when [2QSS*SOV100A or B] is opened.

VALVE COLD SHUTDOWN JUSTIFICATION 13

Basis for CSJ: Therefore, full-stroke exercising in the closed direction is not practical during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised open quarterly per 2OST-13.10A and 2OST-13.10B (Chemical Injection System Valve Position and Pump Operability Tests). Full-stroke exercised closed during cold shutdowns using the alternate method described above per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 14

Valve Mark No(s): 2RSS*29
2RSS*30
2RSS*31
2RSS*32

Category: C **Class:** 2

System: 13 - Containment Depressurization (Recirculation Spray)

Function: These Recirculation Spray Pump discharge header to containment spray ring inside containment isolation check valves are required to close to prevent reverse flow to the opposite train of recirc spray through the spray rings. They are required to open to provide a flowpath from the containment sump via the Recirculation Spray Pumps to the spray rings located in the top of the containment dome in order to depress and maintain the containment pressure subatmospheric following a loss of coolant accident (LOCA).

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed. Their safety positions are open during RSS Pump operation following a LOCA, and closed to prevent reverse flow to the opposite train of recirc spray through the spray rings should a Recirculation Spray Pump not be running. Because the recirculation spray system (RSS) is maintained dry and the RSS Pumps can only be tested during refueling outages, these check valves cannot be exercised with flow during plant operation or during cold shutdown. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arms of each check valve. Because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm, and closed by observation of its mechanical weight loaded swing arm during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 15

Valve Mark No(s): 2CCP*27A
2CCP*27B
2CCP*354
2CCP*355

Category: B **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These Primary Component Cooling Water (CCP) Pump discharge header cross-connect manual isolation valves must close to separate and isolate redundant CCP Pump and CCP Heat Exchanger flowpaths following a passive failure.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These manual valves are normally open during plant operation to allow cross-connection of any two of three CCP Pumps supplying any two of three CCP Heat Exchangers through a Train A or Train B flowpath. Their safety position is closed for train separation. With one of the CCP Heat Exchangers out of service for cleaning, full or part-stroke exercising in the closed direction cannot be performed during plant operation because this would interrupt flow of cooling water to Train A or Train B cooling loads resulting in a thermal transient and potential plant trip. In addition, the idle CCP Heat Exchanger is normally held in reserve following cleaning to improve plant reliability until one of the inservice heat exchangers becomes fouled. Exercising these valves in conjunction with the quarterly pump tests with the "C" CCP Heat Exchanger in service would require placing the clean heat exchanger into service prematurely in order to prevent isolation of the Train A or Train B cooling loads. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 16

Valve Mark No(s):

2MSS*18	2MSS*352
2MSS*19	2MSS*199
2MSS*20	2MSS*196

Category: C **Class:** 3

System: 21 - Main Steam

Function: These Turbine-Driven Auxiliary Feedwater Pump (TDAFWP) steam supply check valves must open to allow steam flow to operate the TDAFWP during an accident. They must close to prevent Steam Generator cross-connection during a high energy line break (HELB) accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety positions are open to support operation of the TDAFWP and closed during a HELB accident. In accordance with Generic Letter No. 89-04, Position 1, a full-stroke exercise in the open direction may be achieved by initiating the maximum required accident condition flow. In order to achieve the required steam flow to meet this requirement, a full flow test of the TDAFWP must be performed at its design flowrate. However, this cannot be performed during plant operation because this would require injecting relatively cold auxiliary feedwater into the Steam Generators which will cause a thermal shock to the auxiliary feedwater and main feedwater piping interface and result in an increased probability of system and component failure. Therefore, a full flow test of the TDAFWP can only be performed during cold shutdowns. The monthly test of the TDAFWP which is run on recirculation flow only, does not require full steam flow. OM-10, Paragraph 4.3.2.2(b) states, "If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns."

Alternate Test: Part-stroke exercised open monthly and full-stroke exercised open during cold shutdowns per 2OST-24.4 (TDAFWP and Check Valve Test). Full-stroke exercising in the closed direction is discussed in VROJ No. 40.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(b).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 17

Valve Mark No(s): 2MSS*AOV101A
2MSS*AOV101B
2MSS*AOV101C

Category: B **Class:** 2

System: 21 - Main Steam

Function: These Main Steamline Isolation Valves (MSIV's) must close to prevent blowdown of the Steam Generators in the case of a high energy line break (HELB) accident, and to provide outside containment isolation of penetration no's. 73, 74 and 75.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during plant operation. Their safety position is closed for HELB isolation, and to provide outside containment isolation of penetration no's. 73, 74 and 75. They are also required to fail closed on a loss of control power. Full-stroke exercising in the closed direction cannot be performed during plant operation because this would cause a reactor trip with the possibility of a safety injection. Although NUREG-1482, Section 4.2.4, "Main Steam Isolation Valves," notes that several plants do not perform a partial stroke exercise of their MSIV's during power operations because this increases the risk of full valve closure when the unit is operating, BVPS-2 Technical Specification 4.7.1.5.a requires a partial stroke exercise of the MSIV's every 92 days when the valves are open. OM-10, Paragraph 4.2.1.2(b) states, "If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns."

Alternate Test: Part-stroke exercised closed quarterly per 2OST-21.1, 2OST-21.2 and 2OST-21.3 (MSIV Partial Closure Tests). Full-stroke exercised and timed closed when going to or following cold shutdowns with TAVG ≥515F per 2OST-21.7 (MSIV Full Closure Test).

In addition, fail-safe testing in the closed direction, as discussed in NUREG-1482, Section 4.2.4 and in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," is also performed during cold shutdowns each time a valve is full-stroke exercised to the closed position during testing per 2OST-21.7 (MSIV Full Closure Test). By depressing both main steam line isolation actuation pushbuttons, this de-energizes the solenoid control power to the MSIV's which in turn isolates instrument air and also vents air off of the valve actuator thus positioning the MSIV's to their fail-safe position.

VALVE COLD SHUTDOWN JUSTIFICATION 17

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(b) and 4.2.1.6.
NUREG-1482, Section 4.2.4.
BVPS-2 Technical Specification 4.7.1.5.a,b.

VALVE COLD SHUTDOWN JUSTIFICATION 18

(DELETED)

VALVE COLD SHUTDOWN JUSTIFICATION 19

Valve Mark No(s): 2SVS*PCV101A
2SVS*PCV101B
2SVS*PCV101C

Category: B **Class:** 2

System: 21 - Main Steam (Vents)

Function: These Steam Generator atmospheric steam dump valves must open to regulate steamline pressure in the event of loss of Condenser steam dump availability and to control Steam Generator pressure after a Reactor trip. They must close to isolate a faulted Steam Generator.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed during plant operation. Their safety positions are open to control Steam Generator pressure after a Reactor trip and closed to isolate a faulted Steam Generator. They are also required to fail closed on a loss of control power. Full or part-stroke exercising in the open and closed directions cannot be performed during plant operation because a reduction in power would be required in order to prevent exceeding full power limitations. If they were full or part-stroke exercised in the open direction during plant operation, steam would be released into the atmosphere, thereby causing a Reactor power transient. In order to prevent this, manual isolation valves would first have to be closed prior to exercising these valves. However, the manual isolation valves could be damaged when they are re-opened against a high differential steam pressure in addition to being located in a potentially hazardous area which would place an unacceptable risk to station personnel. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open and closed, and failed closed in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.

VALVE COLD SHUTDOWN JUSTIFICATION 20

Valve Mark No(s): 2SVS*HCV104

Category: B **Class:** 2

System: 21 - Main Steam (Vents)

Function: This Steam Generator residual heat release valve must open to allow steam flow from any of the Steam Generators to atmosphere via the residual heat release path to aid in removal of all sensible and core decay heat after a reactor shutdown. They must close to isolate a faulted Steam Generator.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: This valve is normally closed during plant operation. Its safety position is open to provide a residual heat release flowpath to atmosphere and closed to isolate a faulted Steam Generator. It is also required to fail closed on a loss of control power. Full or part-stroke exercising in the open and closed directions cannot be performed during plant operation because a reduction in power would be required in order to prevent exceeding full power limitations. If this valve was full or part-stroke exercised in the open direction during plant operation, steam would be released into the atmosphere, thereby causing a Reactor power transient. In order to prevent this, a manual isolation valve would first have to be closed prior to exercising this valve. However, the manual isolation valve could be damaged when it is re-opened against a high differential steam pressure in addition to being located in a potentially hazardous area which would place an unacceptable risk to station personnel. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open and closed, and failed closed in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.

VALVE COLD SHUTDOWN JUSTIFICATION 21

Valve Mark No(s): 2FWS*HYV157A
2FWS*HYV157B
2FWS*HYV157C

Category: B **Class:** 2

System: 24 - Main Feedwater

Function: The Steam Generator main feedwater isolation valves must close in the event of a high energy line break (HELB) or safety injection system actuation to prevent overfeeding the Steam Generators, and to provide outside containment isolation of penetration no's. 76, 77 and 78.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during plant operation providing feedwater flow to the Steam Generators. Their safety position is closed for Train "A" feedwater isolation to the Steam Generators, and to provide outside containment isolation of penetration no's. 76, 77 and 78. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this would isolate or reduce feedwater flow to the Steam Generators resulting in a plant shutdown. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 22

Valve Mark No(s): 2FWS*FCV478
2FWS*FCV488
2FWS*FCV498

Category: B **Class:** 2

System: 24 - Main Feedwater

Function: These Steam Generator main feedwater regulating valves must close in the event of a high energy line break (HELB) or safety injection system actuation to prevent overfeeding the Steam Generators.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normaly open during operation providing feedwater flow to the Steam Generators. Their safety position is closed for Train "B" feedwater isolation to the Steam Generators and they are also required to fail closed on a loss of control power. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this would isolate or reduce feedwater flow to the Steam Generators resulting in a plant shutdown. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised, timed and failed closed in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.

VALVE COLD SHUTDOWN JUSTIFICATION 23

Valve Mark No(s): 2FWE*42A, 2FWE*42B, 2FWE*43A, 2FWE*43B, 2FWE*44A, 2FWE*44B

Category: A/C **Class:** 2

System: 24 - Auxiliary Feedwater

Function: These auxiliary feedwater (AFW) system to Steam Generator header check valves must open to provide an auxiliary feedwater system flowpath to the Steam Generators. They must close to provide header separation in the event of a line break in the upstream AFW system piping during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety positions are open for AFW system injection to the Steam Generators and closed to provide header separation in the event of a line break. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because the test method requires the maximum required accident condition flow to the Steam Generators, in accordance with Generic Letter No. 89-04, Position 1, in order to verify both forward and reverse stroke exercising. However, this and part-stroke exercising cannot be performed during plant operation because this would require injecting relatively cold auxiliary feedwater into the Steam Generators which will cause a thermal shock to the auxiliary feedwater and main feedwater piping interface and result in an increased probability of system and component failure. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised open and closed during cold shutdowns per 2OST-24.6 (AFW System Check Valve Exercise and Flow Verification Test).

References: OM-10, Paragraphs 4.3.2.1, and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 24

Valve Mark No(s): 2FWE*99
2FWE*100
2FWE*101

Category: C **Class:** 2

System: 24 - Auxiliary Feedwater

Function: These auxiliary feedwater (AFW) system to Steam Generator inside containment isolation check valves must close to provide containment isolation of penetration no's. 79, 80 and 83. They must open to provide an auxiliary feedwater system flowpath to the Steam Generators during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety positions are closed for containment isolation of penetration no's. 79, 80 and 83, and open for AFW system injection to the Steam Generators. Full-stroke exercising in the open direction cannot be performed during plant operation because the test method requires the maximum required accident condition flow to the Steam Generators, in accordance with Generic Letter No. 89-04, Position 1. However, this and part-stroke exercising cannot be performed during plant operation because this would require injecting relatively cold auxiliary feedwater into the Steam Generators which will cause a thermal shock to the auxiliary feedwater and main feedwater piping interface and result in an increased probability of system and component failure. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised open during cold shutdowns per 2OST-24.6 (AFW System Check Valve Exercise and Flow Verification Test). Full-stroke exercising in the closed direction is discussed in VROJ No. 43.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 25

Valve Mark No(s): 2FWE*FCV122
2FWE*FCV123A
2FWE*FCV123B

Category: B/C **Class:** 3

System: 24 - Auxiliary Feedwater

Function: These Auxiliary Feedwater (AFW) Pump discharge flow control/check valves have a dual function. As a manual automatic flow control valve, they must open to provide approximately 30% recirculation flow for each AFW Pump to prevent pump damage in the event of isolation of an AFW discharge line to the Steam Generators. They must close in order to isolate this same recirculation flowpath when full AFW Pump flow is being directed to the Steam Generators during an accident. As a check valve, they must open to provide a flowpath from the AFW Pumps to the Steam Generators. They must close to prevent reverse flow and feedwater intra-system recirculation through an idle AFW Pump.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months. Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These valves are normally closed as check valves and normally open as manual automatic flow control valves during plant operation. As a manual automatic flow control valve, their safety positions are open for AFW Pump recirculation and closed for isolation of this recirculation flowpath. As a check valve, their safety positions are open for AFW system injection to the Steam Generators and closed to prevent reverse flow through an idle AFW Pump. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because the test method requires the maximum required accident condition flow to the Steam Generators, in accordance with Generic Letter No. 89-04, Position 1, in order to verify both forward and reverse stroke exercising of the check valve function and closure exercising of the flow control valve function. However, this and part-stroke exercising cannot be performed during plant operation because this would require injecting relatively cold auxiliary feedwater into the Steam Generators which will cause a thermal shock to the auxiliary feedwater and main feedwater piping interface and result in an increased probability of system and component failure. OM-10, Paragraphs 4.2.1.2(c) and 4.3.2.2(c) state, "If exercising is not

VALVE COLD SHUTDOWN JUSTIFICATION 25

Basis for CSJ: practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: The flow control valve function of these valves in the open direction will be full-stroke exercised open quarterly per 2OST-24.2, 2OST-24.3 and 2OST-24.4 (AFW Pump Tests on Recirculation Flow). The flow control valve function of these valves in the closed direction and the check valve function of these valves in the open and closed directions will be full-stroke exercised during cold shutdowns per 2OST-24.4 and 2OST-24.6 (AFW System Check Valve Exercise and Full Flow Verification Tests).

References: OM-10, Paragraphs 4.2.1.1, 4.3.2.1, 4.2.1.2(c) and 4.3.2.2(c). Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 26

Valve Mark No(s): 2SWS*57
2SWS*58
2SWS*59

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump discharge check valves must open to allow cooling water from the river to flow to station loads required during an accident. They must close to prevent reverse flow through an idle SWS Pump.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally open during plant operation. Their safety positions are open to provide SWS cooling to station loads required during an accident, and closed to prevent reverse flow through an idle SWS Pump. Two SWS Pumps are required to be operable during plant operation. In order to full-stroke exercise these check valves in the closed direction, use of the idle SWS pump is required. Quarterly full-stroke exercising in the closed direction may not be possible if one SWS Pump is out of service for maintenance. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised closed quarterly, or when the idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6 (SWS Pump Test). Full-stroke exercising in the open direction is discussed in VROJ No. 44.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 27

Valve Mark No(s): 2SWS*MOV102A
2SWS*MOV102B
2SWS*MOV102C1
2SWS*MOV102C2

Category: B **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump discharge valves must open to provide cooling water from the river to station loads required during an accident.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during plant operation. Their safety position is open to provide SWS cooling to station loads required during an accident. Two SWS Pumps are required to be operable during plant operation. In order to full-stroke exercise these valves in the open direction, one operating pump at a time must be secured while the idle SWS pump is started. Quarterly full-stroke exercising in the open direction may not be possible if one SWS Pump is out of service for maintenance. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open quarterly, or when idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6 (SWS Pump Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 28

Valve Mark No(s): 2SWS*MOV107A
2SWS*MOV107B
2SWS*MOV107C
2SWS*MOV107D

Category: B **Class:** 3

System: 30 - Service Water

Function: These service water (SWS) supply to Secondary Component Cooling Water (CCS) Heat Exchanger isolation valves must close on a CIA signal to isolate the non-safety related portions of the SWS system so that SWS cooling is available for safety related loads during an accident.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during plant operation. Their safety position is closed to isolate the non-safety related portion of the SWS system. Full-stroke exercising in the closed direction cannot be performed during plant operation because closing these valves would isolate the SWS supply to the inservice turbine plant cooling loads including the CCS and chiller unit heat exchangers. This would interrupt flow of cooling water to Train A or B cooling loads resulting in undesirable thermal transients, operational concerns of stability problems and a potential plant trip. Changes in oil temperature from the turbine generator lube oil system create vibration problems. Changes in the hydrogen gas cooler temperature could imply problems or mask real problems with the generator. Chiller unit heat exchanger flow disturbances often result in a trip of the chiller unit causing containment temperature risks of exceeding the Technical Specification limit. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 29

Valve Mark No(s): 2SWS*486
2SWS*487
2SWS*488

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump vaccum break check valves must open to prevent a vacuum from occurring which could damage the SWS Pump seals and piping when the pumps are shut down or trip. They must close during SWS Pump operation to prevent loss of SWS cooling to station loads required during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety positions are open to protect the SWS Pump seals and piping during pump shutdown or trip, and closed to ensure adequate SWS cooling to station loads required during an accident. Two SWS Pumps are required to be operable during plant operation. In order to full-stroke exercise these check valves in the open direction, use of the idle SWS is required. Quarterly full-stroke exercising in the open direction may not be possible if one SWS Pump is out of service for maintenance. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised closed quarterly per 2OST-30.2, 2OST-30.3 and 2OST-30.6 (SWS Pump Test). Full-stroke exercised open quarterly, or when the idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6 (SWS Pump Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 30

Valve Mark No(s): 2FPW*382
2FPW*388
2FPW*753

Category: A/C **Class:** 2

System: 33 - Fire Protection

Function: These fire protection headers inside containment isolation check valves must close to provide containment isolation of penetration no's. 101, 116 and 117.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed and would only be opened in the event of a fire in containment. Their safety position is closed for containment isolation of penetration no's. 101, 116 and 117. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arms of each check valve open and then closed or by leak testing. Because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test), and during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, and 4.3.2.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 31

Valve Mark No(s): 2HVR*MOD23A
2HVR*MOD23B
2HVR*MOD25A
2HVR*MOD25B

Category: A **Class:** 2

System: 44C - Containment Area Ventilation

Function: These containment purge and exhaust inside and outside containment isolation dampers must close to provide containment isolation of penetration no's. 90 and 91. They must also close if radiation levels in containment rise to the high setpoint during refueling operations.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category A valves shall be tested nominally every 3 months.

Basis for CSJ: These motor operated dampers (MOD's) are normally locked shut during plant operation and opened during refueling operations. Their safety position is closed for containment isolation of penetration no's. 90 and 91. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because the Containment Penetration Table requires the MOD's to be locked shut during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test) and during refueling outages per 2OM-44C.1 (Containment Purge and Ventilation/Radiation Monitor Test).

References: OM-10, Paragraphs 4.2.1.1, and 4.2.1.2(c).

SECTION X: VALVE REFUELING OUTAGE JUSTIFICATIONS

VALVE REFUELING OUTAGE JUSTIFICATION 1

Valve Mark No(s): 2RCS*SOV200A, 2RCS*SOV200B, 2RCS*SOV201A, 2RCS*SOV201B, 2RCS*HCV250A, 2RCS*HCV250B

Category: B **Class:** 1,2

System: 6 - Reactor Coolant

Function: These reactor vessel head vent valves must open to vent non-condensable gasses and provide reactor coolant system (RCS) letdown capability from the reactor vessel head to the Pressurizer Relief Tank (PRT). They must close to minimize RCS pressure boundary leakage.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed during plant operation. Their safety positions are closed to minimize RCS pressure boundary leakage, and open to vent the RCS in an emergency to assure that core cooling during natural circulation will not be inhibited by buildup of non-condensable gases. [2RCS*HCV250A and B] are also required to fail closed on a loss of control power. Periodic full or part-stroke exercising in the open and closed directions during normal plant operation could degrade the system by repeatedly challenging the downstream valves due to a phenomenon known as "burping". This phenomenon has been previously described in ASME Report, "Spurious Opening of Hydraulic-Assisted, Pilot-Operated Valves - An Investigation of the Phenomenon." The phenomenon involves a rapid pressure surge buildup at the valve inlet caused by opening the upstream valve in a series double isolation arrangement or by closing a valve in a parallel redundant flowpath isolation arrangement. The pressure surge is sufficient enough to lift the valve plug until a corresponding pressure increase in a control chamber above the pilot and disc can create enough downward differential pressure to close the valve. In addition, per EM 103665 (dated August 4, 1992), Westinghouse does not recommend stroking the HCV's while isolated from the RCS by the SOV's during normal plant conditions (SOV's are required to remain closed to minimize RCS pressure boundary leakage) unless the trapped pressure between the HCV's and SOV's is first relieved by very slowly opening the HCV's. However, this goes against INPO's good practice of not pre-exercising power operated valves prior to stroking and timing them. In addition, if the SOV's are leaking sufficiently, there is the potential for exceeding the design pressure limit of the PRT

VALVE REFUELING OUTAGE JUSTIFICATION 1

Basis for ROJ:

because there is no pressure indication in this piping. Although these valves have been cycled in the past (in December 1996) under special conditions (determined acceptable by DLCO Calculation No. 10080-DLC(P)-900-XD, Rev. 0) so as to enable troubleshooting while the plant was at approximately 400F and 1200 psig, Westinghouse does not recommend "operating" the system to vent the reactor vessel during startup from a refueling outage at pressures exceeding 415 psig (Reference: Letter DLW-89-667, dated June 14, 1989). In addition, per letters PSE-SSA-4743 (dated February 5, 1985) and PT-SSAD-6813 (dated March 30, 1987), Westinghouse does not recommend that the reactor vessel head vent system valves be "tested" at full operating temperature and pressure (620F and 2250 psia), but rather at low temperature and pressure (200F and 300 psia). Based on the above, full or part-stroke exercising in the open and closed directions cannot be performed during normal plant operation. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, the system conditions recommended for "testing" these valves may not always be obtainable during each cold shutdown. Stroke testing, if attempted at cold shutdown, could extend the length of a plant shutdown due to extensive preparatory work in establishing the proper RCS conditions. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test:

Full-stroke exercised and timed open and closed during refueling outages per 2OST-6.9 (Reactor Vessel Head Vent System Test). In addition, fail-safe testing in the closed direction for [2RCS*HCV250A and B], as required by OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," is also performed during refueling outages per 2OST-6.9 (Reactor Vessel Head Vent System Test).

References:

OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c), 4.2.1.2(e) and 4.2.1.6.
EM 103665.
DLCO Calculation No. 10080-DLC(P)-900-XD, Rev. 0.
Westinghouse Letters DLW-89-667, PSE-SSA-4743 and PT-SSAD-6813.
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 2

Valve Mark No(s): 2CHS*22
2CHS*23
2CHS*24

Category: C **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Charging Pump discharge check valves must open to provide a flowpath from the Charging Pumps to the reactor coolant (RCS) loops for high head safety injection (HHSI). They must close to prevent reverse flow through an idle Charging Pump.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation to support Charging Pump operation. Their safety positions are open for HHSI and closed to prevent reverse flow through an idle Charging Pump. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the Charging Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed via the HHSI hot or cold legs injection flowpaths because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. However, part-stroke exercising in the open direction and full-stroke exercising in the closed direction is possible via normal charging during plant operation. OM-10, Paragraph, 4.3.2.2(b) states, "If full-stroke exercising during plant operation is not practicable it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns." During cold shutdowns, however, full flow exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Part-stroke exercised open and full-stroke exercised closed quarterly per 2OST-7.4, 2OST-7.5 and 2OST-7.6 (Charging Pump Tests). Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

VALVE REFUELING OUTAGE JUSTIFICATION 2

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(b) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 3

Valve Mark No(s): 2CHS*31

Category: A/C **Class:** 2

System: 7 - Chemical and Volume Control

Function: This charging header inside containment isolation check valve must close to provide containment isolation of penetration no. 15.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally open when the charging system is in service. Its safety position is closed for containment isolation of penetration no. 15. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to full or part-stroke exercise this check valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing because stopping the RCP's could extend the cold shutdown period and would be burdensome to the licensee. In addition, there could be a head of water creating a d/p against the check valve disk due to elevation differences between downstream piping and the reactor coolant system (RCS). Therefore, in order to cycle this check valve open so that it can be verified to close, the d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 3

Alternate Test: Full-stroke exercised open quarterly with flow per 2OST-7.4,5 or 6 (Charging Pump Tests). Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT-1.47.11 (Safety Injection and Charging System Containment Penetration Integrity Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 4

Valve Mark No(s): 2CHS*LCV115C
2CHS*LCV115E

Category: B **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Volume Control Tank (VCT) outlet isolation valves must close on a safety injection signal to ensure the suction of the charging / high head safety injection (HHSI) system is switched from the VCT to the Refueling Water Storage Tank (RWST).

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open when the charging system is in service. Their safety position is closed to ensure the suction of the Charging Pumps is switched from the VCT to the RWST following a safety injection signal. Full or part-stroke exercising in the closed direction cannot be performed during plant operation without isolating the VCT from the Charging Pumps or potentially damaging the Charging Pumps due to inadequate suction flow. This would also result in loss of or limited pressurizer level control, normal reactor coolant system makeup, and loss of or limited seal injection flow to the Reactor Coolant Pump (RCP) seals resulting in seal damage. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

VALVE REFUELING OUTAGE JUSTIFICATION 4

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 5

Valve Mark No(s): 2CHS*AOV204

Category: A **Class:** 2

System: 7 - Chemical and Volume Control

Function: This Non-Regen Heat Exchanger inlet and letdown isolation outside containment isolation valve must close to secure letdown flow and limit inventory loss from the reactor coolant system (RCS) on receipt of a CIA. It must also close to provide containment isolation of penetration no. 28.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: This valve is normally open when the charging system is in service to provide a flowpath for letdown flow from the RCS. Its safety position is closed for containment isolation of penetration no. 28, and also for letdown isolation. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this will result in a thermal shock to the Regenerative Heat Exchanger and associated component piping resulting in an increased probability of system and component failures. In addition, failure of this valve in the closed position could lead to a loss of pressurizer level control and require a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). A failure of this valve in the closed position could lead to the shutdown of a Charging Pump and unnecessary shutdown of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke this valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 5

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 6

Valve Mark No(s): 2CHS*MOV289

Category: A **Class:** 2

System: 7 - Chemical and Volume Control

Function: This normal charging header makeup and outside containment isolation valve must close on a safety injection signal to ensure that flow from the high head safety injection (HHSI) system is switched from normal charging to the safety injection system. It must also close to provide containment isolation of penetration no. 15.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: This valve is normally open when the charging system is in service to provide a flowpath for normal charging to the RCS. Its safety position is closed for containment isolation of penetration no. 15, and also for normal charging isolation. Full-stroke exercising in the closed direction cannot be performed during plant operation because this will result in a thermal shock to the Regenerative Heat Exchanger and associated component piping resulting in an increased probability of system and component failures. In addition, failure of this valve in the closed position could lead to a loss of pressurizer level control and require a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). A failure of this valve in the closed position could lead to the shutdown of a Charging Pump and unnecessary shutdown of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke this valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 6

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 7

Valve Mark No(s): 2CHS*MOV308A
2CHS*MOV308B
2CHS*MOV308C

Category: A **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Reactor Coolant Pump (RCP) seal water supply outside containment isolation valves must close to provide containment isolation of penetration no's. 35, 36 and 37.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open when the charging system is in service to provide seal injection flow to the RCP seals. Their safety position is closed for containment isolation of penetration no's. 35, 36 and 37. Full-stroke exercising in the closed direction cannot be performed during plant operation because this would secure seal injection water to the RCP seals, resulting in seal damage. In addition, failure of these valves in the closed position will result in a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 8

Valve Mark No(s): 2CHS*MOV310

Category: B **Class:** 2

System: 7 - Chemical and Volume Control

Function: This Regenerative Heat Exchanger outlet isolation and normal charging system makeup valve must close on a safety injection signal to ensure that flow from the high head safety injection (HHSI) system is switched from normal charging to the safety injection system.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: This valve is normally open when the charging system is in service to provide a flowpath for normal charging to the RCS. Its safety position is closed for isolation of normal charging. Full-stroke exercising in the closed direction cannot be performed during plant operation because this will result in a thermal shock to the Regenerative Heat Exchanger and associated component piping resulting in an increased probability of system and component failures. In addition, failure of this valve in the closed position could lead to a loss of pressurizer level control and require a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). A failure of this valve in the closed position could lead to the shutdown of a Charging Pump and unnecessary shutdown of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke this valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 8

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 9

Valve Mark No(s): 2CHS*MOV378
2CHS*MOV381

Category: A **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Reactor Coolant Pump (RCP) seal water return inside and outside containment isolation valves must close to provide containment isolation of penetration no. 19.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open when the charging system is in service to provide seal water return from the RCP's. Their safety position is closed for containment isolation of penetration no. 19. Full-stroke exercising in the closed direction cannot be performed during plant operation because this would secure seal water return from the RCP's, resulting in seal damage. In addition, failure of these valves in the closed position will result in a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal water return from the RCP's, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 10

Valve Mark No(s): 2CHS*LCV460A
2CHS*LCV460B

Category: B **Class:** 1

System: 7 - Chemical and Volume Control

Function: These Regenerative Heat Exchanger inlet letdown isolation valves must close to secure letdown flow and limit inventory loss from the reactor coolant system (RCS) on receipt of a low level signal derived from the pressurizer level control system.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open when the charging system is in service to provide a flowpath for letdown flow from the RCS. Their safety position is closed for letdown isolation. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this will result in a thermal shock to the Regenerative Heat Exchanger and associated component piping resulting in an increased probability of system and component failures. In addition, failure of this valve in the closed position could lead to a loss of pressurizer level control and require a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). A failure of this valve in the closed position could lead to the shutdown of a Charging Pump and unnecessary shutdown of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 10

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test). In addition, fail-safe testing in the closed direction in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," is also performed each time a valve is full-stroke exercised to the closed position during testing per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c), 4.2.1.2(e) and 4.2.1.6.
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 11

Valve Mark No(s): 2CHS*473

Category: A/C **Class:** 2

System: 7 - Chemical and Volume Control

Function: This seal water return inside containment isolation thermal relief check valve must close to provide containment isolation of penetration no. 19. It must also open to allow excess pressure trapped in the containment penetration due to thermal expansion to be equalized with the pressure inside the seal return line, inside containment.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed when the charging system is in service returning seal injection flow from the Reactor Coolant Pumps (RCP's). Its safety position is closed for containment isolation of penetration no. 19, however, it will momentarily open if required to relieve pressure trapped in the containment penetration due to thermal expansion. Full or part-stroke in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arm of the check valve. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the open and closed directions may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to full or part-stroke exercise these check valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected check valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 11

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm, and closed by observation of its mechanical weight loaded swing arm during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 12

Valve Mark No(s): 2CHS*474
2CHS*475
2CHS*476

Category: A/C **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Reactor Coolant Pump seal water supply inside containment isolation check valves must close to provide containment isolation of penetration no's. 35, 36 and 37.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open when the charging system is in service to supply seal injection flow to the Reactor Coolant Pump (RCP) seals. Their safety positions are closed for containment isolation of penetration no's. 35, 36 and 37. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arms of these check valves open and then closed or by leak testing. Because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to full or part-stroke exercise these check valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing because stopping the RCP's could extend the cold shutdown period and would be burdensome to the licensee. In addition, there could be a head of water creating a d/p against the check valve disks due to elevation differences with downstream piping.

VALVE REFUELING OUTAGE JUSTIFICATION 12

Basis for ROJ: Therefore, in order to cycle these check valves open so that they can be verified to close, the d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing, " plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT-1.47.11 (Safety Injection and Charging System Containment Penetration Integrity Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 13

Valve Mark No(s):

2CHS*MOV8130A	2CHS*MOV8132A
2CHS*MOV8130B	2CHS*MOV8132B
2CHS*MOV8131A	2CHS*MOV8133A
2CHS*MOV8131B	2CHS*MOV8133B

Category: B **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Charging Pump suction and discharge isolation valves must close to provide isolation and separation of the high head safety injection (HHSI) flow trains during the long term recirculation phase of safety injection.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: The suction valves are normally de-energized and locked open for Appendix R and the discharge valves are normally de-energized and locked open per technical specifications. Their safety positions are closed for safety injection train separation during cold leg recirculation, however, only one valve in the suction line and one valve in the discharge line are required to close for train separation during this scenario. Full-stroke exercising in the closed direction cannot be performed during plant operation because the valves are required to be de-energized and locked open for Appendix R or per technical specifications. In addition, failure of these valves in the closed position under certain Charging Pump operating configurations could result in damage to a Charging Pump, loss of pressurizer level control, loss of normal reactor coolant system makeup or loss of seal injection flow to the Reactor Coolant Pump (RCP) seals resulting in seal damage. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves without the potential risk in damage to a Charging Pump or RCP seals, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days.

VALVE REFUELING OUTAGE JUSTIFICATION 13

Basis for ROJ: OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 14

Valve Mark No(s): 2SIS*6
2SIS*7

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: These Low Head Safety Injection (LHSI) Pump discharge check valves must open to provide a flowpath from the LHSI Pumps to the reactor coolant (RCS) loops for LHSI. They must close to prevent reverse flow through an idle LHSI Pump back to the Refueling Water Storage Tank (RWST).

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are open for LHSI and closed to prevent reverse flow through an idle LHSI Pump. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed quarterly per 2OST-11.1 and 2OST-11.2 (LHSI Pump Tests). Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 15

Valve Mark No(s): 2SIS*27

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: This High Head Safety Injection (HHSI) Pump suction check valve from the Refueling Water Storage Tank (RWST) must open to provide a flowpath from the RWST to the suction of the HHSI Pumps during an accident. It must close when the RWST is empty to prevent reverse flow of containment sump water from entering the RWST.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed during plant operation. Its safety position is open for HHSI and closed during transfer to recirc to prevent reverse flow to the RWST. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the Charging Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed during plant operation because the HHSI Pumps must be aligned to take suction from the RWST. The boron concentration of the RWST water could cause reactivity transients in the Reactor and force a plant shutdown. In addition, injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, full flow exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(d) states, "If exercising is not practicable during plant operation and full-stroke exercising during cold shutdowns is also not practicable, it may be limited to part-stroke exercising during cold shutdowns and full-stroke exercising during refueling outages."

Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. This involves the installation and removal of special test equipment in order to perform the leakage testing. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate

VALVE REFUELING OUTAGE JUSTIFICATION 15

Basis for ROJ: testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Part-stroke exercised open during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test). Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test). Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.47.11 (Safety Injection and Charging System Containment Penetration Integrity Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(d) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 16

Valve Mark No(s): 2SIS*42

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: This inside containment isolation check valve on the makeup water supply header to the Safety Injection Accumulators must close to provide containment isolation of penetration no. 20.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed and is only opened when the Hydro Test Pump is supplying makeup water from the RWST to the Safety Injection Accumulators. Its safety position is closed for containment isolation of penetration no. 20. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, because downstream MOV's which isolate this fill header from each Safety Injection Accumulator may not be leak tight, and because the Accumulators may still be pressurized to approximately 600 psig during cold shutdown, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if backleakage through the MOV's is present. Therefore, in order to cycle this check valve open so that it can be verified to close, trapped d/p may have to be equlized or removed. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1 "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 17

Valve Mark No(s): 2SIS*46
2SIS*47

Category: C **Class:** 2

System: 11 - Safety Injection

Function: These Recirculation Spray Pump discharge to Low Head Safety Injection (LHSI) Pump discharge check valves must open during the Recirculation Phase to provide a recirculation flowpath from the containment sump via the C and D Recirculation Spray Pumps to the suction of the High Head Safety Injection (HHSI) Pumps.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed. Their safety position is open during the Recirculation Phase. These check valves cannot be exercised with flow without injecting containment sump water via the Recirculation Spray (RSS) Pumps into the LHSI/HHSI Systems. Therefore, full or part-stroke exercising in the open direction can only be verified by cycling the mechanical weight loaded swing arms of each check valve. Exercising these weighted arm check valves in the open direction requires excessive forces due to the head of water present from the Refueling Water Storage Tank (RWST) against the check valve disks. However, Engineering does not recommend applying the excessive forces required to cycle the check valves open. Therefore, in order to cycle these check valves open, the d/p created by the head of water from the RWST must either be equalized or removed. This must be done to ensure repeatability of breakaway torque test results for IST trending purposes. Setting up the conditions necessary to equalize or remove any d/p is not practicable during power operation or during cold shutdowns because this requires installation of a hose between an upstream drain valve in the RSS System and a downstream drain valve in the LHSI System for each check valve. This would also create excessive unavailability time if done at power and could result in a delayed plant startup if done at cold shutdown. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. In addition, OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

VALVE REFUELING OUTAGE JUSTIFICATION 17

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 18

Valve Mark No(s): 2SIS*83
2SIS*84
2SIS*94
2SIS*95

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) inside containment isolation check valves must close to provide containment isolation of penetration no's. 7, 17, 34 and 113. They must open for HHSI hot leg and cold leg recirculation.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed. Their safety positions are closed for containment isolation of penetration no's. 7, 17, 34 and 113, and open for HHSI hot leg and cold leg recirculation. During plant operation when the reactor coolant system (RCS) is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the Charging Pumps will not develop the required flow. In addition, they also cannot be full or part-stroke exercised with flow in the open direction during plant operation due to the potential for thermal shock on the injection nozzles from a cold water injection. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arms of the check valves. However, because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, because downstream check valves which isolate the HHSI system from the RCS may not be leak tight, and because the RCS may still be pressurized during cold shutdown, full or part-stroke exercising by cycling the Mechancal weight loaded swing arms in the open and closed directions may not be possible during cold shutdown if backleakage through the downsteam check valves is present. In addition, there could also be a head of water creating a d/p against the check valve disks due to elevation differences between downstream piping and the reactor coolant system (RCS). Therefore, in order to cycle the mechanical weight loaded swing arms of these check valves, the d/p may have to be equalized or removed to ensure repeatability of breakaway torque test results for IST trending purposes.

VALVE REFUELING OUTAGE JUSTIFICATION 18

Basis for ROJ: Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. In addition, full or part-stroke exercising in the open direction with flow cannot be performed during cold shutdown because flow testing could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open with flow during refueling outages per 2OST-11.14B (HHSI Full Flow Test). Full-stroke exercised closed by observation of its mechanical weight loaded swing arm upon cessation of flow during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 19

Valve Mark No(s): 2SIS*107
2SIS*108
2SIS*109

Category: A/C **Class:** 1

System: 11 - Safety Injection

Function: These low head safety injection (LHSI) header check valves must open to provide a flowpath from the LHSI Pumps to the reactor coolant system (RCS) cold legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation for isolation of the LHSI piping from the higher pressure RCS. Their safety position is open for LHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 20

Valve Mark No(s): 2SIS*122
2SIS*123
2SIS*124
2SIS*125
2SIS*126
2SIS*127

Category: C **Class:** 1

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) header check valves must open to provide a flowpath from the HHSI Pumps to the reactor coolant system (RCS) hot legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety position is open for HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the HHSI Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 21

Valve Mark No(s): 2SIS*128
2SIS*129

Category: A/C **Class:** 1

System: 11 - Safety Injection

Function: These low head safety injection (LHSI) header check valves must open to provide a flowpath from the LHSI Pumps to the reactor coolant system (RCS) hot legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation for isolation of the LHSI piping from the higher pressure RCS. Their safety position is open for LHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 22

Valve Mark No(s): 2SIS*130

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: This low head safety injection (LHSI) inside containment isolation check valve must close to provide containment isolation of penetration no. 61. It must open for LHSI hot leg recirculation.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed to provide reactor coolant system (RCS) pressure boundary isolation. Its safety position is closed for containment isolation of penetration no. 61, and open for LHSI hot leg recirculation. During plant operation when the RCS is at normal operating pressure, full or part-stroke exercising this check valve in the open direction with flow cannot be performed because the Low Head Safety Injection Pumps cannot develop enough head to overcome RCS pressure. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arm of the check valve. However, because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, because downstream check valves which isolate the LHSI system from the RCS may not be leak tight, and because the RCS may still be pressurized during cold shutdown, full or part-stroke exercising by cycling the mechanical weight loaded swing arms in the open and closed directions may not be possible during cold shutdown if backleakage through the downstream check valves is present. In addition, there could also be a head of water creating a d/p against the check valve disk due to elevation differences between downstream piping and the reactor coolant system (RCS). Therefore, in order to cycle the mechanical weight loaded swing arm of the check valve, the d/p may have to be equalized or removed to ensure repeatability of breakaway torque test results for IST trending purposes. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown.

VALVE REFUELING OUTAGE JUSTIFICATION 22

Basis for ROJ: In addition, full or part-stroke exercising in the open direction with flow cannot be performed during cold shutdown because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open with flow during refueling outages per 2OST-11.14A (LHSI Full flow Test). Full-stroke exercised closed by observation of its mechanical weight loaded swing arm upon cessation of flow during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 23

Valve Mark No(s): 2SIS*132
2SIS*133

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: These low head safety injection (LHSI) inside containment isolation check valves must close to prevent reverse flow from the opposite train of LHSI during an accident, and also to provide containment isolation of penetration no's. 60 and 62. They must open for LHSI cold leg recirculation.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed to provide reactor coolant system (RCS) pressure boundary isolation. Their safety positions are closed to prevent reverse flow from the opposite train of LHSI during an accident and for containment isolation of penetration no's. 60 and 62. Their safety positions are also open for LHSI cold leg recirculation. During plant operation when the RCS is at normal operating pressure, full or part-stroke exercising in the open direction with flow cannot be performed because the Low Head Safety Injection Pumps cannot develop enough head to overcome RCS pressure. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arms of the check valves. However, because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, because downstream check valves which isolate the LHSI system from the RCS may not be leak tight, and because the RCS may still be pressurized during cold shutdown, full or part-stroke exercising by cycling the mechanical weight loaded swing arms in the open and closed directions may not be possible during cold shutdown if backleakage through the downstream check valves is present.

VALVE REFUELING OUTAGE JUSTIFICATION 23

Basis for ROJ: In addition, there could also be a head of water creating a d/p against the check valve disk due to elevation differences between downstream piping and the reactor coolant system (RCS). Therefore, in order to cycle the mechanical weight loaded swing arm of the check valve, the d/p may have to be equalized or removed to ensure repeatability of breakaway torque test results for IST trending purposes. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. In addition, full or part-stroke exercising in the open direction with flow cannot be performed during cold shutdown because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open with flow during refueling outages per 2OST-11.14A (LHSI Full Flow Test). Full-stroke exercised closed by observation of its mechanical weight loaded swing arm upon cessation of flow during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 24

Valve Mark No(s): 2SIS*134
2SIS*135
2SIS*136
2SIS*137
2SIS*138
2SIS*139

Category: C **Class:** 1

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) header check valves must open to provide a flowpath from the HHSI Pumps to the reactor coolant system (RCS) cold legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety position is open for HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the HHSI Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 25

Valve Mark No(s): 2SIS*545
2SIS*546

Category: C **Class:** 1

System: 11 - Safety Injection

Function: These low head / high head safety injection (LHSI / HHSI) header check valves must open to provide a flowpath from either the LHSI Pumps or HHSI Pumps to the reactor coolant system (RCS) "B" and "C" loop hot legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety position is open for LHSI and HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. In addition, full-stroke exercising in the open direction cannot be performed using the HHSI Pumps because they will not develop the required flow. Part-stroke exercising in the open direction cannot be performed using the HHSI Pumps because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, part-stroke exercising in the open direction using the HHSI Pumps cannot be performed because this could result in low-temperature overpressurization of the RCS. Full or part-stroke exercising in the open direction cannot be performed during cold shutdowns using the LHSI Pumps because this would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 26

Valve Mark No(s): 2SIS*547

Category: C **Class:** 1

System: 11 - Safety Injection

Function: This high head safety injection (HHSI) header check valve must open to provide a flowpath from the HHSI Pumps to the reactor coolant system (RCS) "A" loop hot leg during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed during plant operation. Its safety position is open for HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the HHSI Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 27

Valve Mark No(s): 2SIS*548
2SIS*550
2SIS*552

Category: C **Class:** 1

System: 11 - Safety Injection

Function: These low head / high head safety injection (LHSI / HHSI) header check valves must open to provide a flowpath from either the LHSI Pumps or HHSI Pumps to the reactor coolant system (RCS) cold legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety position is open for LHSI and HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. In addition, full-stroke exercising in the open direction cannot be performed using the HHSI Pumps because they will not develop the required flow. Part-stroke exercising in the open direction cannot be performed using the HHSI Pumps because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, part-stroke exercising in the open direction using the HHSI Pumps cannot be performed because this could result in low-temperature overpressurization of the RCS. Full or part-stroke exercising in the open direction cannot be performed during cold shutdowns using the LHSI Pumps because this would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 28

Valve Mark No(s): 2SIS*MOV836

Category: A **Class:** 2

System: 11 - Safety Injection

Function: This high head safety injection (HHSI) to cold leg injection header outside containment isolation valve must close to provide containment isolation of penetration no. 34. It must open to establish a flowpath to the reactor coolant system (RCS) cold legs when transferring to the cold leg recirculation mode.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: This valve is normally closed. Its safety position is closed for containment isolation of penetration no. 34, and open for cold leg recirculation. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because this will inject relatively cold water into the RCS cold legs and cause thermal shock to system piping and components which will result in an increased probability of system and component failures. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the open and closed directions may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). Cycling this valve open and closed with a Charging Pump operating to support RCP operation would cause significant changes in pressures and flows to the RCP seals, resulting in seal damage. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

VALVE REFUELING OUTAGE JUSTIFICATION 28

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 29

Valve Mark No(s): 2SIS*MOV869A
2SIS*MOV869B

Category: A **Class:** 2

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) to hot leg injection header outside containment isolation valves must close to provide containment isolation of penetration no's. 7 and 17. They must open to establish a flowpath to the reactor coolant system (RCS) hot legs when transferring to the hot leg recirculation mode and must re-close when transferring back to the cold leg recirculation mode.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed. Their safety positions are closed for containment isolation of penetration no's. 7 and 17, and open and closed for hot and cold leg recirculation. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because this will inject relatively cold water into the RCS cold legs and cause thermal shock to system piping and components which will result in an increased probability of system and component failures. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the open and closed directions may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). Cycling these valves open and closed with a Charging Pump operating to support RCP operation would cause significant changes in pressures and flows to the RCP seals, resulting in seal damage. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 29

Alternate Test: Full-stroke exercised and timed open and closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 30

Valve Mark No(s): 2SIS*MOV8889

Category: A **Class:** 2

System: 11 - Safety Injection

Function: This low head safety injection (LHSI) to hot leg injection header outside containment isolation valve must close to provide containment isolation of penetration no. 61. It must open to establish a flowpath to the reactor coolant system (RCS) hot legs when transferring to the hot leg recirculation mode and must re-close when transferring back to the cold leg recirculation mode.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: This valve is normally de-energized closed per technical specifications. Its safety position is closed for containment isolation of penetration no. 61, and open and closed for hot and cold leg recirculation. Full-stroke exercising in the open and closed directions cannot be performed during plant operation when the RCS is at normal operating pressure because failure of this valve in the open position could result in overpressurization of the low pressure portion of the LHSI system piping if downstream check valves to the RCS are not leak tight. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the open and closed directions may not be possible during cold shutdown if the RCS is still pressurized during cold shutdown and backleakage through downstream check valves from the RCS still exists. Setting up the plant conditions (RCS pressure) necessary to permit exercising this valve without threat of overpressurizing the low pressure portion of the LHSI system piping could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during cold shutdowns when the RCS is vented or at reduced pressure, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 31

Valve Mark No(s): 2CVS*93

Category: A/C **Class:** 2

System: 12 - Containment Vacuum

Function: This Containment Airborne Activity Radiation Monitor Pump discharge header and post-accident sampling system (PASS) inside containment isolation check valve must close to provide containment isolation of penetration no. 43. It must re-open to permit sampling of the containment atmosphere after an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally open during plant operation to support continuous sampling of the containment atmosphere. Its safety position is closed for containment isolation of penetration no. 43, and open for post-accident sampling of the containment atmosphere. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because these check valves are located inside containment and are not accessible during plant operation. In addition, installation and removal of test equipment in order to perform leakage testing, if attempted during cold shutdowns, could result in a delayed plant startup. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 31

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.47.5 (Type-C Leak Test).

Per NUREG-1482, Section 4.4.2, "Post-Accident Sampling System Valves," valves in the PASS that perform a containment isolation function are required to be included in the IST Program as Category A or A/C and be tested to Code requirements (for the containment isolation function) except where relief has been granted. The remaining valves in the PASS would typically be tested as required by the technical specifications or other documents and need not be included in the IST Program. However, the NRC recommends that if the licensee elects to include these valves in the IST Program, a note be included that the testing is beyond the scope of 10CFR50.55a. Although not required per NUREG-1482, Section 4.4.2, the opening function of this check valve has been included in the BVPS-2 IST Program because it has a function to re-open to sample the containment atmosphere following an accident. Based on the above, however, full-stroke exercising in the open direction is not required to meet the requirements of 10CFR50.55a which includes Generic Letter No. 89-04, Position 1. Therefore, this check valve will be verified to stroke open each quarter by observing Containment Airborne Activity Radiation Monitor performance per 2OM-54.3, Station Log L5-133 in accordance with OM-10, Paragraph 4.2.1.5, "Valves in Regular Use."

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(e) and 4.2.1.5.
Generic Letter No. 89-04, Position 1.
NUREG-1482, Sections 4.1.4 and 4.4.2.

VALVE REFUELING OUTAGE JUSTIFICATION 32

Valve Mark No(s): 2QSS*3
2QSS*4

Category: A/C **Class:** 2

System: 13 - Containment Depressurization (Quench Spray)

Function: These quench spray header inside containment isolation check valves must close to provide containment isolation of penetration no's. 63 and 64. They must open to provide a flowpath from the RWST via the Quench Spray Pumps to the containment spray rings in order to depressurize the containment following a loss of coolant accident (LOCA).

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed. Their safety positions are closed for containment isolation of penetration no's. 63 and 64, and open for the purpose of depressurizing the containment following a LOCA. These check valves cannot be exercised with flow without injecting water through the spray rings and spraying down containment. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arms of each check valve. Because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Exercising these weighted arm check valves in the open direction at cold shutdown requires excessive forces due to the head of water which exists above the check valve disks. The head of water is created through equalization with the level of water in the Refueling Water Storage Tank (RWST) via an open flowpath to the quench spray piping in containment. However, Engineering does not recommend applying the excessive forces required to cycle the check valves open. Therefore, in order to cycle these check valves open, the d/p created by the head of water above the check valves must be bled off by draining the piping. This must be done in order to ensure that any d/p across the check valves is removed to ensure repeatability of breakaway torque test results for IST trending purposes. The amount of potentially contaminated water drained from the system would create additional liquid waste for disposal which is not practicable if done at cold shutdown.

VALVE REFUELING OUTAGE JUSTIFICATION 32

Basis for ROJ: Setting up the conditions necessary to drain the piping could also result in a delayed plant startup if done at cold shutdown. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2.(e)
NUREG-1482, Sections 3.1.1.1

VALVE REFUELING OUTAGE JUSTIFICATION 33

Valve Mark No(s): 2QSS*MOV102A
2QSS*MOV102B

Category: B **Class:** 2

System: 13 - Containment Depressurization (Quench Spray)

Function: These Quench Spray Chemical Addition Tank discharge to Chemical Injection Pump Suction isolation valves must open to provide a flowpath of 23% to 25% sodium hydroxide (NaOH) solution to either the Quench Spray Pumps or containment sump for removal of radioactive iodine from the containment atmosphere during an accident.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed to isolate the Quench Spray Chemical Addition Tank from the suction of the Chemical Injection Pumps so that NaOH solution is not introduced into downstream piping which typically contains Refueling Water Storage Tank (RWST) water used for testing of quench spray system pumps and valves. Their safety position is open for injection of NaOH solution into the quench spray following a CIB actuation. Full-stroke exercising in the open direction cannot be performed during plant operation because this introduces 23% to 25% NaOH solution from the Chemical Addition Tank into the piping downstream of these valves. Attempts to purge the downstream piping using a backflush of RWST water to the safeguards sump after valve stroking has proven ineffective. Subsequent testing of the Chemical Injection Pumps on recirculation with the RWST results in sodium contamination of the RWST. During refueling outages the reactor coolant system (RCS), fuel pool and RWST are all in direct communication, therefore any sodium intrusion into the RWST will eventually spread to the RCS, a highly undesirable situation.

VALVE REFUELING OUTAGE JUSTIFICATION 33

Basis for ROJ: Removal of sodium from the RWST is a difficult process which involves recirculation of the RWST through the Fuel Pool Ion Exchangers. This process can degrade RWST cooling (RWST temperature is limited by Technical Specifications), and can take months to reduce the concentration to the desired level. In order to prevent any sodium introduction into the RWST, a more effective flush after valve stroking could be performed, but it involves a much longer period of system inoperability. Performance at cold shutdown would allow a more thorough backflush while in a mode where the system is not required by Technical Specifications, however, the number of flushes needed could still result in a delayed plant startup, and would also create additional liquid waste for disposal which is not practicable. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 34

Valve Mark No(s): 2QSS*267

Category: A/C **Class:** 2

System: 13 - Containment Depressurization (Quench Spray)

Function: This Chemical Injection Pump to containment sump discharge check valve must close to provide containment isolation of penetration no. 118. It must open to provide a chemical injection flowpath of 23% to 25% sodium hydroxide solution from the Chemical Injection Pumps directly to the containment sump following a CIB.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed. Its safety position is closed for containment isolation of penetration no. 118, and open to provide a chemical injection flowpath to the containment sump following a CIB. This check valve cannot be exercised with flow without injecting sodium hydroxide solution into the containment sump. Therefore, full or part-stroke exercising in the open and closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve. Because this check valve is located inside containment, it is not accessible for testing during plant operation. In order to exercise this weighted arm check valve in the open and closed directions during cold shutdown, scaffolding must be erected in order to gain access to the check valve which could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 35

Valve Mark No(s): 2CCP*4
2CCP*5
2CCP*6

Category: C **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These Primary Component Cooling Water (CCP) Pump discharge check valves must open to supply CCP cooling water to the Residual Heat Removal (RHR) Heat Exchangers in order to achieve cold shutdown conditions following an accident. They must close to prevent reverse flow through the idle CCP Pump(s).

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation. Their safety positions are open to provide CCP cooling to the RHR Heat Exchangers to support cooldown of the plant to cold shutdown conditions, and closed to prevent reverse flow through the idle CCP Pump(s). Full-stroke exercising in the open direction cannot be performed during plant operation because normal plant operating loads do not support enough CCP flow to develop the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1. In order to increase flow above the maximum required accident condition flowrate, the manual throttle valves at the discharge of the RHR Heat Exchangers would require throttling in the open direction. Since these valves are located inside containment, they are not accessible during plant operation. OM-10, Paragraph 4.3.2.2(b) states, "If full-stroke exercising during plant operation is not practicable it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the open direction may not be possible during cold shutdown if a Reactor Coolant Pump (RCP) is operating. In order to support RCP operation, reactor coolant system (RCS) temperature must be greater than 100F. Increasing CCP cooling flow through the RHR Heat Exchangers would reduce RCS temperature and could require shutdown of a RCP.

VALVE REFUELING OUTAGE JUSTIFICATION 35

Basis for ROJ: Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. In addition, setting up the plant conditions necessary to align the CCP system through the RHR Heat Exchangers as described

Alternate Test: Part-stroke exercised open and full-stroked exercised closed quarterly per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (CCP Pump Tests). Full-stroke exercised open during cold shutdowns when the RCP's are secured, or at least during refueling outages per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (CCP Pump Tests).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(b) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Sections 3.1.1.1 and 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 36

Valve Mark No(s): 2CCP*AOV107A
2CCP*AOV107B
2CCP*AOV107C

Category: A **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These Reactor Coolant Pump (RCP) Thermal Barrier Cooler primary component cooling water (CCP) outlet isolation valves must close to isolate the lower pressure CCP system from the higher pressure reactor coolant system (RCS) in the event of a primary loop to CCP leak in the RCP Thermal Barrier Cooler.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open to allow return of CCP cooling water from the RCP Thermal Barrier Coolers during RCP operation. Their safety position is closed in the event of a primary loop to CCP leak in the RCP Thermal Barrier Cooler. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this would interrupt or reduce flow of cooling water to the RCP seals. This could result in damage to the RCP seals. In addition, failure of these valves in the closed position could also result in a plant shutdown to avoid or due to RCP seal damage. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if a RCP is operating. In order to stroke these valves without the potential risk in damage to the RCP seals, the RCP's would have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10 Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 37

Valve Mark No(s):

2CCP*MOV150-1	2CCP*MOV156-1
2CCP*MOV150-2	2CCP*MOV156-2
2CCP*MOV151-1	2CCP*MOV157-1
2CCP*MOV151-2	2CCP*MOV157-2

Category: A **Class:** 2

System: 15 - Primary Component Cooling Water

Function: These primary component cooling water (CCP) supply to and return from containment inside and outside containment isolation valves must close to provide containment isolation of penetration no's. 1, 2, 4 and 5. They must open, post-accident following reset of a CIB, to support cooling of the Residual Heat Removal (RHR) Heat Exchangers during shutdown to cold shutdown conditions.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open to provide CCP cooling water for various components inside containment. Their safety positions are closed for containment isolation of penetration no's. 1, 2, 4 and 5, and open to support cooling of the RHR Heat Exchangers during shutdown to cold shutdown conditions. Full-stroke exercising in the closed direction cannot be performed during plant operation because this would interrupt flow of cooling water to the Reactor Coolant Pump (RCP) seals. This could result in damage to the RCP seals. In addition, failure of these valves in the closed position could also result in a plant shutdown to avoid or due to RCP seal damage. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if a RCP is operating. In order to stroke these valves without the potential risk in damage to the RCP seals, the RCP's would have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. Therefore, these valves should only be tested when the RCP's are secured.

VALVE REFUELING OUTAGE JUSTIFICATION 37

Basis for ROJ: OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages." However, per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. If the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop. Failure of any valve to re-open during tetng at that time would cause a loss of cooling flow for one of the required RCS loops. Therefore, in order to maintain this "defense in depth" strategy for shutdown safety with the RHR System not in service, and based on the fact that these valves should not be cycled when the RCP's are operating, these valves should only be exercised closed during refueling outages when the core is defueled.

Alternate Test: Full-stroke exercised and timed open and closed during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.
NUREG-1449.
Technical Specification 3/4.4.1.3.

VALVE REFUELING OUTAGE JUSTIFICATION 38

Valve Mark No(s): 2CCP*289
2CCP*290
2CCP*291

Category: A/C **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These primary component cooling water (CCP) supply to Reactor Coolant Pump (RCP) Thermal Barrier Cooler check valves must close to isolate the lower pressure CCP system from the higher pressure reactor coolant system (RCS) in the event of a primary loop to CCP leak in the RCP Thermal Barrier Cooler.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during RCP operations to supply CCP cooling water to the RCP Thermal Barrier Coolers. Their safety position is closed in the event of a primary loop to CCP leak in the RCP Thermal Barrier Coolers. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because these check valves are located inside containment and are not accessible during plant operation. In addition, installation and removal of test equipment in order to perform leakage testing, if attempted during cold shutdowns, could result in a delayed plant startup.
NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 39

Valve Mark No(s): 2CCP*352

Category: C **Class:** 3

System: 15 - Primary Component Cooling Water

Function: This primary component cooling water (CCP) check valve is located in the return line from the Containment Instrument Air Compressors and must close to isolate these non-safety related pieces of equipment from the safety class 3 CCP piping when upstream motor operated valves (MOV's) close on a CIA.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally open during operation of the Containment Instrument Air Compressors. Its safety position is closed to isolate the non-safety related compressors from the safety class 3 CCP piping. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because this would cause extended interruption of CCP cooling water to the Containment Instrument Air Compressors. In addition, installation and removal of test equipment in order to perform leakage testing, if attempted during cold shutdowns, could result in a delayed plant startup. Per NUREG-1482 Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 40

Valve Mark No(s): 2MSS*352, 2MSS*18, 2MSS*19, 2MSS*199, 2MSS*20, 2MSS*196

Category: C **Class:** 3

System: 21 - Main Steam

Function: These Turbine Driven Auxiliary Feedwater Pump (TDAFWP) steam supply check valves must open to allow steam flow to operate the TDAFWP during an accident. They must close to prevent Steam Generator cross-connection during a high energy line break (HELB) accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are open to support operation of the TDAFWP and closed during a HELB accident. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. This involves the installation and removal of special test equipment in order to perform the leakage testing. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test). Full and part-stroke exercising in the open direction is discussed in VCSJ No. 16.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 41

Valve Mark No(s): 2SVS*80
2SVS*81
2SVS*82

Category: C **Class:** 2

System: 21 - Main Steam (Vents)

Function: These Steam Generator residual heat release check valves must open to allow steam flow from the Steam Generators to atmosphere via the residual heat release path to aid in removal of all sensible and core decay heat after a reactor shutdown. They must close to prevent Steam Generator cross-connection during a high energy line break (HELB) accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are open to provide a residual heat release flowpath to atmosphere and closed during a HELB accident. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. This involves the installation and removal of special test equipment in order to perform the leakage testing. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test). Full-stroke exercising in the open direction is discussed in VROJ No. 51.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 42

Valve Mark No(s): 2FWS*28
2FWS*29
2FWS*30

Category: C **Class:** 2

System: 24 - Main Feedwater

Function: These main feedwater system to Steam Generator inside containment header isolation check valves must close for feedwater isolation of the Steam Generators in the event if a high energy line break (HELB), and to prevent reverse flow to the non-safety related main feedwater system piping during operation of the Auxiliary Feedwater (AFW) Pumps during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation to provide main feedwater flow to the Steam Generators. Their safety position is closed for feedwater isolation in the event of a HELB and to ensure adequate AFW Pump flow to the Steam Generators during an accident. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because it involves filling the Steam Generators to $\geq$85% level and shutting down all feedwater flow to the Steam Generators. In addition, leak testing if attempted during cold shutdowns could result in a delayed plant startup. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2OST-24.8 (Feedwater Check Valve Exercise Verification Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 43

Valve Mark No(s): 2FWE*99
2FWE*100
2FWE*101

Category: C **Class:** 2

System: 24 - Auxiliary Feedwater

Function: These auxiliary feedwater (AFW) system to Steam Generator inside containment isolation check valves must close to provide containment isolation of penetration no's. 79, 80, and 83. They must open to provide an auxiliary feedwater system flowpath to the Steam Generators during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are closed for containment isolation of penetration no's. 79, 80 and 83, and open for AFW system injection to Steam Generators. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because it involves filling the Steam Generators to ≥85% level and shutting down all flow to the Steam Generators. In addition, leak testing if attempted during cold shutdowns could result in a delayed plant startup. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2OST-24.8A (Auxiliary Feedwater Check Valve Reverse Flow Test). Full-stroke exercising in the open direction is discussed in VCSJ No. 24.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 44

Valve Mark No(s): 2SWS*57
2SWS*58
2SWS*59

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump discharge check valves must open to allow cooling water from the river to flow to station loads required during an accident. They must close to prevent reverse flow through an idle SWS Pump.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation. Their safety positions are open to provide SWS cooling to station loads required during an accident, and closed to prevent reverse flow through an idle SWS Pump. Full-stroke exercising in the open direction cannot always be performed during plant operation because normal plant operating loads do not always support enough SWS flow to develop the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1. OM-10, Paragraph 4.3.2.2(b) states, "If full-stroke exercising during plant operation is not practicable it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns." Note that full-stroke exercising in the open direction may still be possible during warm summer months when additional flowpaths and heat exchangers are in service, however, this can normally only be accomplished by aligning the SWS system through additional flowpaths which are only used for accident conditions and through additional heat exchangers not normally in service. The additional heat exchangers are maintained isolated for biota control to prevent fouling. Placing flow through these additional flowpaths and heat exchangers unnecessarily during quarterly or cold shutdown testing could increase the potential for fouling, thereby degrading this part of the SWS system and reducing its reliability in meeting the required flowrates during an accident. In addition, setting up the plant conditions necessary to align the SWS system through additional flowpaths and/or heat exchangers as described above could also result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 44

Alternate Test: Part-stroke exercised open quarterly and full-stroke exercised open during warm summer months when additional flowpaths and heat exchangers are in service per 2OST-30.2, 2OST-30.3 and 2OST-30.6 (SWS Pump Tests). At least full-stroke exercised open during refueling outages per 2OST-30.2, 2OST-30.3 and 2OST-30.6 (SWS Pump Tests) or per 2OST-30.13A or B (SWS Full Flow Tests). Full-stroke exercising in the closed direction is discussed in VCSJ No. 26.

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(b) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 45

Valve Mark No(s): 2SWS*106
2SWS*107

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump header check valves must open to allow cooling water from the river to flow to station loads required during an accident. They must close to prevent reverse flow by the Standby Service Water Pumps when they are supplying the SWS headers.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation. Their safety positions are open to provide SWS cooling to station loads required during an accident, and closed to prevent reverse flow to the SWS system if a Standby Service Water Pump is operating. Full-stroke exercising in the open direction cannot always be performed during plant operation because normal plant operating loads do not always support enough SWS flow to develop the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1. OM-10, Paragraph 4.3.2.2(b) states, "If full-stroke exercising during plant operation is not practicable it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns." Note that full-stroke exercising in the open direction may still be possible during warm summer months when additional flowpaths and heat exchangers are in service, however, this can normally only be accomplished by aligning the SWS system through additional flowpaths which are only used for accident conditions and through additional heat exchangers not normally in service. The additional heat exchangers are maintained isolated for biota control to prevent fouling. Placing flow through these additional flowpaths and heat exchangers unnecessarily during quarterly or cold shutdown testing could increase the potential for fouling, thereby degrading this part of the SWS system and reducing its reliability in meeting the required flowrates during an accident. In addition, setting up the plant conditions necessary to align the SWS system through additional flowpaths and/or heat exchangers as described above could also result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 45

Basis for ROJ:

Full or part-stroke exercising in the closed direction can only be performed by leakage testing because no other practical means is available. This involves shutting down the operating Service Water Pump supplying the associated SWS header and providing an upstream vent path with a Standby Service Water Pump providing reverse flow for verifying check valve closure. If the SWS header cannot be depressurized, then the opposite trains Service Water Pump must also be shutdown so that the SWS headers can be cross-connected at the Service Water Pumps in order to provide a large enough upstream vent path of sufficient capacity to support the leakage test. This is not possible during plant operation because two Service Water Pumps are required to be operable per Technical Specifications. This is not practical during cold shutdowns because it may require the SWS headers to be cross-connected which could affect the availability of safety related SWS to support the Emergency Diesel Generator operability and RHR System operability during cold shutdown. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e), states, "if exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test:

Part-stroke exercised open quarterly and full-stroke exercised open during warm summer months when additional flowpaths and heat exchangers are in service per 2OST-30.2, 2OST-30.3 and 2OST-30.6 (SWS Pump Tests). At least full-stroke exercised open during refueling outages per 2OST-30.2, 2OST-30.3 and 2OST-30.6 (SWS Pump Tests) or per 2OST-30.13A or B (SWS Full Flow Tests). Full-stroke exercised closed by leakage testing during refueling outages per 2OST-30.8A or B (Standby Service Water System Tests).

References:

OM-10, Paragraphs 4.3.2.1, 4.3.2.2(b) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 46

Valve Mark No(s): 2SWS*MOV103A
2SWS*MOV103B

Category: B **Class:** 3

System: 30 - Service Water

Function: These Recirculation Spray (RSS) Heat Exchanger service water (SWS) supply isolation valves must open to supply SWS cooling water to the RSS Heat Exchangers during a CIB. They must re-close in the long term post-accident following a CIB and with the residual heat removal (RHR) system placed into service, to provide SWS cooling for the Component Cooling Water (CCP) Heat Exchangers in order to cool the RHR Heat Exchangers and bring the plant to cold shutdown conditions.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed during plant operation to isolate SWS flow to the RSS Heat Exchangers which are maintained in a dry lay-up condition. Their safety positions are open to supply DBA flow to the RSS Heat Exchangers following a CIB, and closed to ensure adequate SWS cooling for RHR cooldown of the plant to cold shutdown conditions. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because failure of the valves in the open position would require a plant shutdown because the SWS system cannot simultaneously support normal plant operations and full flow to RSS Heat Exchangers. Failure of the valves in the open position during cold shutdowns would result in a delayed plant startup. In addition, full-stroke exercising in the open and closed directions during normal operation or during cold shutdowns would unnecessarily degrade the operational readiness of the RSS Heat Exchangers by depositing Asiatic clams, other marine life, river mud and silt in the heat exchangers. Therefore, exercising these valves during normal plant operation and during cold shutdowns is not practicable. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during refueling outages per 2OST-30.13A and 2OST-30.13B (SWS Full Flow Tests).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(e).

VALVE REFUELING OUTAGE JUSTIFICATION 47

Valve Mark No(s): 2SWS*MOV106A
2SWS*MOV106B

Category: B **Class:** 3

System: 30 - Service Water

Function: These service water system (SWS) supply header isolation valves must close on receipt of a CIB signal to ensure sufficient SWS cooling flow to the Recirculation Spray Heat Exchangers. They must re-open in the long term post-accident following a CIB to provide SWS cooling for the Component Cooling Water (CCP) Heat Exchangers in order to cool the Residual Heat Removal (RHR) Heat Exchangers and bring the plant to cold shutdown conditions.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open during plant operation to support SWS operation. Their safety position is closed to ensure sufficient SWS supply to the Recirculation Spray Heat Exchangers, and open to support RHR operation for cooldown of the plant to cold shutdown conditions. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because closing these valves would isolate SWS supply to the inservice primary (CCP) and secondary (CCS) component cooling water and chiller unit heat exchangers. Failure of these valves to reopen after closure either during plant operation or during cold shutdowns would interrupt flow of cooling water to Train A or B cooling loads resulting in undesirable thermal transients, operational concerns of stability problems and a potential plant trip. Changes in oil temperature from the turbine generator lube oil system create vibration problems. Changes in the hydrogen gas cooler temperature could imply problems or mask real problems with the generator. Chiller unit heat exchanger flow disturbances often result in a trip of the chiller unit causing containment temperature risks of exceeding the Technical Specification limit. Changes in CCP cooling to the Reactor Coolant Pump (RCP) thermal barrier heat exchangers, bearing lube oil coolers and motor stator air coolers could result in heatup of the RCP's and require a plant trip and shutdown of the RCP's. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if a RCP is operating. In order to stroke these valves without the potential risk in damage to the RCP's, the RCP's

VALVE REFUELING OUTAGE JUSTIFICATION 47

Basis for ROJ: would have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during cold shutdowns when the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test) or 2OST-30.13A and 2OST-30.13B (SWS Full Flow Tests).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 48

Valve Mark No(s): 2SWS*1103
2SWS*1104

Category: C **Class:** 3

System: 30 - Service Water

Function: These service water system (SWS) check valves are located in the supply lines to the main steam valve house (MSVH) cooling headers. They must close to prevent draining the inlet lines to the MSVH Cooling Coils during a SWS Pump trip on a loss of power in order to prevent a water hammer during subsequent pump restarts.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: One of these check valves is normally open during plant operation to provide SWS cooling to the inservice MSVH Cooling Coils. Their safety position is closed to prevent draining the inlet lines to the MSVH Cooling Coils during a SWS Pump trip on a loss of power. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because this would involve isolating one SWS header while two SWS headers are required to be inservcie during plant operation. In addition, leak testing if attempted during cold shutdowns could result in a delayed plant startup. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test).

References: .OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 49

Valve Mark No(s): 2IAC*22

Category: A/C **Class:** 2

System: 34 - Compressed Air (Containment Instrument Air)

Function: This containment instrument air header inside containment isolation check valve must close to provide containment isolation of penetration no. 59.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally open and will remain open during operation of the containment instrument air system. Its safety position is closed for containment isolation of penetration no. 59. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." It is not practicable to cycle this check valve during cold shutdown because the containment instrument air system must be shutdown, which must typically be supported by a special valve alignment from the station service air system to maintain an air supply to containment components. Setting up the conditions necessary to maintain an air supply to containment components could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by observation of its mechancal weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 50

Valve Mark No(s): 2SIS*141, 2SIS*142, 2SIS*145, 2SIS*147, 2SIS*148, 2SIS*151

Category: A/C **Class:** 1

System: 11 - Safety Injection

Function: These Safety Injection (SI) Accummulator series discharge check valves must open upon depressurization of the RCS during a loss of coolant accident (LOCA) to provide a flowpath from the SI Accumulators to the reactor coolant system (RCS) cold legs. [2SIS*141 and 145] must also open to provide a flowpath for the residual heat removal (RHR) system when it is placed into service for cooldown of the plant to cold shutdown conditions.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months. Per OM-10, Paragraph 4.3.2.4(a), "Valve Obturator Movement," the necessary valve obturator movement shall be demonstrated by exercising the valve and observing that the obturator opens to the position required to fulfill its function.

Basis for ROJ: These check valves are normally closed as pressure isolation valves (PIV's) during plant operation to isolate the lower pressure SI Accumulators from the high pressure RCS. Their safety position is open for for passive low pressure injection of the SI Accumulators into the RCS cold legs during a LOCA. An additional safety position for [2SIS*141 and 145] is open to support RHR system operation during cooldown of the plant to cold shutdown conditions. Full or part-stroke exercising in the open direction cannot be performed during plant operation because the RCS is at a higher pressure than the SI Accumulators. During cold shutdowns, [2SIS*141 and 145] are capable of being part-stroke exercise in the open direction during RHR system operation. However, full-stroke exercising of all six check valves in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addiction to part-stroke exercising the remaining four check valves in the open direction, cannot be performed during cold shutdowns because of a lack of installed instrumentation. A proposed alternate method which measures a flow coefficient value (C_v) during a blowdown at reduced accumulator pressure (see next paragraph), also cannot be performed during cold shutdowns because of a lack of

VALVE REFUELING OUTAGE JUSTIFICATION 50

Basis for ROJ:

installed instrumentation and an uncontrolled test volume change if the SI Accumulator discharge MOV isolation valves are opened at low RCS pressure. In addition, the reduced pressure which is required to perform this alternate test method may not always be obtainable during each cold shutdown. Therefore, stroke testing, if attempted at cold shutdowns, could extend the length of a plant shutdown due to the extensive preparatory work in establishing the proper RCS and SI Accumulator conditions necessary to perform the test, due to delays involved with installation and removal of test equipment inside containment, and for delays while the SI Accumulators are re-filled and pressurized. For [2SIS*141 and 145], OM-10, Paragraph 4.3.2.2(d) states, "If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, it may be limited to part-stroke during cold shutdown, and full-stroke during refueling outages." For the remaining check valves, OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke during refueling outages."

These SI Accumulator series discharge check valves will be full-stroke exercise in the open direction during each refueling outage using a method similar to the test used at the Fort Calhoun Nuclear Station (References: NUREG-1482, Section 4.1.2, "Exercising Check Valves with Flow and Nonintrusive Techniques," Issue 1). The test method will measure a flow coefficient value (C_v) during a blowdown at reduced accumulator pressure. The SER for the Fort Calhoun test method will be followed and the recommendations incorporated.

Alternate Test:

[2SIS*141 and 145] will be part-stroke exercised open during cold shutdowns per 2OST-10.1 and 2OST-10.2 (RHR Pump Performance Tests). The remaining check valves will be full-stroke exercised open during refueling outages per 2BVT 1.11.3 (SI Accumulator Discharge Check Valves Full Stroke Test). As a special test after maintenance, 2OST-11.15 may be performed to part-stroke exercise applicable check valve(s) in the open direction.

References:

OM-10, Paragraphs 4.3.2.1, 4.3.2.4(a), 4.3.2.2(e) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Section 4.1.2 (Issue 1).

VALVE REFUELING OUTAGE JUSTIFICATION 51

Valve Mark No(s): 2SVS*80
2SVS*81
2SVS*82

Category: C **Class:** 2

System: 21 - Main Steam (Vents)

Function: These Steam Generator residual heat release check valves must open to allow steam flow from the Steam Generators to atmosphere via the residual heat release path to aid in removal of all sensible and core decay heat after a reactor shutdown. They must close to prevent Steam Generator cross-connection during a high energy line break (HELB) accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are open to provide a residual heat release flowpath to atmosphere and closed during a HELB accident. Full or part-stroke exercising in the open direction cannot be performed during plant operation because a reduction in power would be required in order to prevent exceeding full power limitations. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because there is not motive force (steam flow) to open the check valves. It is not desirable to forward stroke exercise these check valves with maximum required accident condition flow while shutting down to cold shutdown or during startup from cold shutdown when steam flow is available in Mode 3, because a possible uncontrolled cooldown could occur outside of Technical Specification and administrative limits, which if exceeded, could create positive reactivity. Per OM-10, Paragraph 4.3.2.4(c), "As an alternative to the testing in Paragraph 4.3.2.4(a) or (b), disassembly every refueling outage to verify operability of check valves may be used." In addition, per Generic Letter No. 89-04, Position 2, "Where the licensee determines that it is burdensome to disassemble and inspect all applicable valves each refueling outage, a sample disassembly and inspection plan for groups of identical valves in similar applications may be employed."

VALVE REFUELING OUTAGE JUSTIFICATION 51

Alternate Test: Maintenance is to disassemble and inspect one check valve in accordance with the sample frequency requirements of Generic Letter No. 89-04, Position 2, per 1/2 CMP-75-ENERTECH CHECK-1M during each refueling outage. A part-stroke exercise in the open direction will be performed after valve reassembly per 2OM-50.4.A, "Plant Heatup from Mode 5 to Mode 4." Full-stroke exercising in the closed direction is discussed in VROJ No. 41.

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.4(c)
Generic Letter No. 89-04, Position 2
BVPS Condition Report 981791

VALVE REFUELING OUTAGE JUSTIFICATION 52

Valve Mark No(s): 2RCS*68

Category: A/C **Class:** 2

System: 6 - Reactor Coolant

Function: This inside containment isolation check valve on the nitrogen supply to the Pressurizer Relief Tank [2RCS-TK22] must close to provide containment isolation of penetration no. 49.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed and is only opened during nitrogen makeup to the Pressurizer Relief Tank. Its safety position is closed for containment isolation of penetration no. 49. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Because this check valve is normally isolated by upstream and downstream isolation valves, a d/p across the check valve may be created due to thermal expansion when the cooler nitrogen gas is subjected to a higher containment termperatures. Therefore, in order to cycle this check valve open so that it can be verified to close, trapped d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any trapped d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 53

Valve Mark No(s): 2RCS*72

Category: A/C **Class:** 2

System: 6 - Reactor Coolant

Function: This inside containment isolation check valve on the primary grade water supply to the Pressurizer Relief Tank [2RCS-TK22] must close to provide containment isolation of penetration no. 45.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed and is only opened during primary grade water makeup to the Pressurizer Relief Tank. Its safety position is closed for containment isolation of penetration no. 45. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Because this check valve is normally isolated by upstream and downstream isolation valves, a d/p across the check valve may be created due to thermal expansion when the cooler fluid is subjected to a higher containment termperatures. Therefore, in order to cycle this check valve open so that it can be verified to close, trapped d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any trapped d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by observation to its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 54

Valve Mark No(s): 2FPW*761

Category: A/C **Class:** 2

System: 33 - Fire Protection

Function: This fire protection header inside containment isolation check valve must close to provide containment isolation of penetration no. 99.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed and would only be opened in the event of a fire in containment. Its safety position is closed for containment isolation of penetration no. 99. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, the upstream MOV, although isolated, is cycled open quarterly which allows some water to flow past this check valve and into the downstream piping. Because a head of water may exist against the check valve disk due to elevation differences between the check valve and downstream fire protection piping in containment, the water may need to be drained in order to cycle the check valve. Setting up the conditions necessary to drain the downstream side of the check valves in order to bleed off any trapped pressure could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by observation to its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 55

Valve Mark No(s): 2RSS*MOV154C
2RSS*MOV154D

Category: B **Class:** 2

System: 13 - Recirculation Spray

Function: These recirculation spray pump recirculation valves must open to provide a minimum recirculation flowpath for [2RSS*P21C and D] when pump flowrate is low following a CIB or during the recirculation mode of safety injection. They must close to isolate the recirculation flowpath so that all recirculation spray flow is directed to the spray rings in containment following a CIB.

Test Requirement: Per OM, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed. Their safety positions are open to provide a minimum recirculation flowpath for C and D recirculation spray pumps if flowrate is low following a CIB or during the recirculation mode of safety injection, and closed to isolate the recirculation flowpath so that all recirculation spray flow is directed to the spray rings in containment following a CIB. These valves do not have a control switch from which to stroke each valve. Their operation is strictly automatic as determined by recirculation spray pump flowrate. In order to cycle these valves open and closed for timing, a jumper wire must be installed in the circuitry of each valve or recirculation spray pump flow must be initiated. Installing a jumper creates a hardship as described in NUREG-1482, Section 3.1.1, "Deferring Valve Testing to Each Cold Shutdown or Refueling Outage," and could delay a plant startup if performed during cold shutdown. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. In addition, establishing recirculation spray pump flow can only be accomplished during refueling outages as described in Pump Refueling Outage Justification (PROJ) No. 1. OM-10, Paragraph 4.2.1.2(e) states, "if exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages.

Alternate Test: Full-stroke exercised and timed open and closed during recirculation spray pump testing at refueling outages per 2BVT 1.13.5 (Recirculation Spray Pump Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(e).
NUREG-1482, Section 3.1.1 and 3.1.1.1.

SECTION XI: VALVE RELIEF REQUESTS

VALVE RELIEF REQUEST 1

This Relief Request was converted into VROJ50 per the NRC SER for the Second 10-Year Interval for Pumps and Valves Inservice Testing (IST) Program - BVPS-2, dated November 18, 1997.

VALVE RELIEF REQUEST 2

Valve Mark No(s): 2EGA*SOV202-1
2EGA*SOV202-2
2EGA*SOV203-1
2EGA*SOV203-2

Category: B **Class:** 3

System: 36 - 4KV Station Service (Diesel Air Start)

Function: These Emergency Diesel Generator air start solenoid valves must open to permit air to start the Emergency Diesel Generators.

Test Requirement: Per OM-10, Paragraph 4.2.1.3, "Valve Obturator Movement," the necessary valve obturator movement shall be determined by exercising the valve while observing an appropriate indicator, such as indicating lights which signal the required change of obturator position. Per OM-10, Paragraphs 4.2.1.4(a) and (b), "Power-Operated Valve Stroke Timing," the stroke time of all power-operated valves shall be measured to at least the nearest second with a limiting value of full-stroke time specified.

Basis for Relief: In accordance with 10CFR50.55a(f)(5)(iii), relief is requested on the basis that compliance with the code requirements is impractical for BVPS-2.

These valves are quick acting and do not have position indication. Therefore, in accordance with NUREG-1482, Section 4.2.8, "Solenoid-Operated Valves," operation of these valves will be monitored by timing the starting time to rated speed of each Emergency Diesel Generator (EDG). Individual valves will be tested by isolating one bank of air prior to starting the EDG on an alternating frequency. This will ensure each bank is capable of starting the EDG's in the required time and that the air start solenoids are not degrading. Per NUREG-1482, Section 3.4, "Skid-Mounted Components and Component Subassemblies," the staff has determined that the testing of the major component is an acceptable means for verifying the operational readiness of the skid-mounted and component subassemblies if the licensee documents this approach in the IST Program.

Alternate Test: Stroked and indirectly timed on an alternating frequency in conjunction with 2OST-36.1 and 2OST-36.2 (Emergency Diesel Generator Monthly Tests). Assign a limiting stroke time based on the EDG starting requirements (≤10 seconds).

References: OM-10, Paragraphs 4.2.1.3, 4.2.1.4(a) and 4.2.1.4(b).
NUREG-1482, Sections 3.4 and 4.2.8.